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**SOUTH BRANCH  
KISHWAUKEE RIVER  
NEAR SYCAMORE  
DEKALB COUNTY, ILLINOIS**

**RECONNAISSANCE REPORT  
FOR SECTION 205  
FLOOD CONTROL PROJECT**

OCTOBER 1981



**US Army Corps  
of Engineers**  
Rock Island District

**81 12 31 007**



DEPARTMENT OF THE ARMY  
ROCK ISLAND DISTRICT, CORPS OF ENGINEERS  
CLOCK TOWER BUILDING  
ROCK ISLAND, ILLINOIS 61201

SOUTH BRANCH KISHWAUKEE RIVER NEAR SYCAMORE  
DEKALB COUNTY, ILLINOIS

RECONNAISSANCE REPORT FOR  
SECTION 205 FLOOD CONTROL PROJECT

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### ACKNOWLEDGMENT

Many members of the Rock Island District assisted in the preparation of this report. Primary study team personnel who contributed are listed below:

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## SYLLABUS

The DeKalb County Board requested assistance from the US Army Corps of Engineers, Rock Island District, to determine a solution for the flood problems east of the city limits of Sycamore, Illinois. Damages occur primarily to homes in the Evergreen Village Mobile Home Park.

This reconnaissance report is a summary of the four functional planning tasks: Problem Identification, Formulation of Alternatives, Impact Assessment, and Evaluation.

This study identified possible nonstructural solutions to the flooding problem that warrant further study in a Detail Project Report. However, the local sponsor does not want to continue with further study of these plans because of the high estimate of non-Federal costs.

It is recommended that further Federal action for flood control measures for the Evergreen Village Mobile Home Park be terminated.

SOUTH BRANCH KISHWAUKEE RIVER NEAR SYCAMORE  
DEKALB COUNTY, ILLINOIS

RECONNAISSANCE REPORT FOR  
SECTION 205 FLOOD CONTROL PROJECT

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SOUTH BRANCH KISHWAUKEE RIVER NEAR SYCAMORE  
DEKALB COUNTY, ILLINOIS

RECONNAISSANCE REPORT FOR  
SECTION 205 FLOOD CONTROL PROJECT

SECTION 1 - INTRODUCTION

This report presents the results of an investigation of flooding problems along the East Branch of the South Branch of the Kishwaukee River east of the city limits of Sycamore, Illinois.

AUTHORITY

SPECIFIC AUTHORIZATION

The Corps of Engineers has been given authority to study and construct small projects without the specific authorization of Congress. The authority for this report is Section 205 of the Flood Control Act approved 30 June 1948, as amended by Section 205 of the Flood Control Act approved 23 October 1962; Section 61 of the Water Resources Development Act approved 7 March 1974; and Section 133(b) of the Water Resources Development Act approved 22 October 1976. The authority, as amended, is presented below:

The Secretary of the Army is authorized to allot from any appropriations heretofore or hereafter made for flood control, not to exceed \$30,000,000 for any one fiscal year, for the construction of small projects for flood control and related purposes not specifically authorized by Congress, which come within the provisions of Section 1 of the Flood Control Act of June 22, 1936, when in the opinion of the Chief of Engineers such work is advisable. The amount allotted for a project shall be sufficient to complete Federal participation in the project. Not more than \$2,000,000 shall be allotted under this section for a project at any single locality, except that not more than \$3,000,000 shall be allotted under this section for a project at a single locality if such project protects an area which has been declared to be a major disaster area pursuant to the Disaster Relief Act of 1966 or the Disaster Relief Act of 1970 in the five-year period immediately preceding the date the Chief of Engineers deems such work advisable. The provisions of local cooperation specified in Section 3 of the Flood Control Act of June 22, 1936, as amended, shall apply. The work shall be complete in itself and not commit the United States to any additional improvement to insure its successful operation, except as may result from the normal procedure applying to projects authorized after submission of preliminary examination and survey reports.

## DISTRICT INTERPRETATION

There are no limitations imposed on the study of the flood problems caused by the East Branch of the South Branch of the Kishwaukee River by Corps of Engineers policy. However, there are limitations to investigations for small drainage areas by the Corps. Watersheds with a discharge less than 800 cubic feet per second (c.f.s.) for the 10-percent flood (i.e., 10-year flood) are considered part of the local storm sewer system and cannot be investigated by the Corps under existing authorities.

## SCOPE OF STUDY

A reconnaissance study is the initial investigation to provide the Division Engineer with sufficient justification for authorizing a Detailed Project Report or for termination of the study.

## DELINEATION OF STUDY AREA

The study area is located in DeKalb County, Illinois, east of the city limits of Sycamore. The DeKalb County Board is primarily concerned with flooding in Section 33 of Sycamore Township at a property commonly known as the Evergreen Village Mobile Home Park located on State Highway 64. Other properties located on both sides of Highway 64 east of Sycamore were also included in the study. See Plate 1, "Location of the Study Area."

## STUDY DURATION

This study was initiated at the request of the DeKalb County Board followed by the gathering of data in October 1979. A copy of the letter request is contained in Appendix C of this report. Formulation studies in excess of the normal reconnaissance level were undertaken due to the emphasis on non-structural measures.

## TYPE, DEPTH, AND DETAIL OF INVESTIGATIONS

Three basic investigations were made: engineering, economic, and environmental. The studies were in sufficient detail to analyze the need for a project, develop preliminary plans, determine views and capabilities of local interest, and determine the economic feasibility of various plans. Possible environmental issues that must be addressed were noted, as were data deficiencies that must be rectified if/when a feasibility study is conducted.

## STUDY PARTICIPANTS AND COORDINATION

### PARTICIPANTS AND CONTRIBUTIONS

Throughout this study, coordination was maintained with those agencies and entities directly involved. Coordination and preliminary review of the proposed plan of action will be made by agencies and local officials, including the following:

- \* US Army Corps of Engineers, Rock Island District
- \* US Department of Interior, Fish and Wildlife Service
- \* US Environmental Protection Agency
- \* US Department of Agricultural, Soil Conservation Service
- \* Illinois Bureau of Natural Resources
- \* Illinois Department of Transportation
- \* Illinois State Clearinghouse
- \* DeKalb County Board of Supervisors

The County Board of DeKalb County, Illinois, requested the study. The Board has provided information on the local flooding problems and information on the value of flood damages.

The US Fish and Wildlife Service made a field review of the problem area and has provided a Planning Aid Letter (see Appendix C, Pertinent Correspondence).

The Rock Island District, Corps of Engineers, is providing technical input for this study and is also managing the study. The District's inputs are in the fields of plan formulation, social and economic studies, environmental and cultural resource studies, and hydrology and hydraulic studies. The Division Real Estate Office at Rock Island has also provided a study on Real Estate costs.

### THE REPORT AND STUDY PROCESS

The report and study process under the authority of Section 205 of the Flood Control Act of 1948, as amended, starts with a reconnaissance study and report. A Detailed Project Report (DPR) is made if the Reconnaissance Report indicates that the project is feasible. If the DPR indicates that the project is feasible, funding will be requested from the office of the Chief of Engineers to prepare plans and specifications and to construct the project. This planning process is consistent with established Corps of Engineers planning procedures and the Principles and Standards for water resource planning developed by the Water Resources Council.

The following four conditions must be met before a Reconnaissance Report can recommend that a Detailed Project Report be made:

1. There must be a Federal interest in the problem identified in the reconnaissance study;

2. There must exist solutions to the identified problems for which Federal participation may be justified under an existing authority;

3. There are existing non-Federal entities which are legally and financially capable of satisfying the local cooperation requirements for the recommended solutions; and

4. A DPR can be accomplished at a reasonable cost compared to the respective benefits.

This planning process provides a systematic approach for analyzing problems and needs, establishing specific objectives from the general objectives, and developing and evaluating alternative management plans using a team approach. The basic philosophy of the team approach is that viable resource management plans require interdisciplinary planning to adequately address the broad range of complex issues involved, including the economic, environmental, and social consequences of plan implementation.

## SECTION 2 - PROBLEM IDENTIFICATION

This section of the Reconnaissance Report addresses the national and specific planning objectives and the problems, needs, and conditions of the study area.

### NATIONAL OBJECTIVES

The plan formulation process to accomplish flood damage reduction at the Evergreen Village Mobile Home Park and flood plain area to the east was formulated and directed by two co-equal national planning objectives:

\* National Economic Development (NED) - To enhance the national economic development by increasing the value of the Nation's output of goods and services and improving the national economic efficiency.

\* Quality of the Environment (EQ) - To enhance the quality of environment through the management, conservation, preservation, creation, restoration, and improvement of the quality of certain natural and cultural resources and ecological systems.

## ANALYSIS OF PREVIOUS STUDIES

### CORPS OF ENGINEERS

Only one previously published Corps of Engineers study was used in the preparation of this Reconnaissance Report:

\* South Branch Kishwaukee River Flood Plain Information, DeKalb County, Illinois, prepared for the State of Illinois, Division of Waterways, Department of Public Works and Buildings, by US Army Corps of Engineers, Rock Island District, June 1971. This report evaluates the flood situation along the South Branch and the East Branch of the South Branch of the Kishwaukee River in DeKalb County, Illinois. The study reviews the records of the largest known floods and estimates possible future floods.

### STUDIES OF OTHERS

No other studies were known to be available for use in the preparation of this report.

## PUBLIC CONCERNS

### CONCERNS WITHIN THE STUDY AUTHORITY

There are four concerns that have been expressed by representatives of DeKalb County. They are contained in a letter from Mr. Steve Johnson, DeKalb County Emergency Services and Disaster Agency, to Mr. James Whitford, Administrative Aid, DeKalb County, dated 27 June 1979. The four expressed concerns are all related to the flooding of Evergreen Village Mobile Home Park by the East Branch of the South Branch of the Kishwaukee River, and by a smaller tributary. They are as follows:

1. Flooding of the mobile homes causing damages to personal property and other inconveniences.
2. Flooding required that the electricity and gas be shut off.
3. A health danger existed due to the flooding of the sewage plant. The safety and health hazards resulted in the mobile home park being evacuated in 1979.
4. The letter expresses a feeling that the use of levees will only move the flooding problem to another location.

## CONCERNS NOT WITHIN THE STUDY AUTHORITY

DeKalb County has not expressed any concerns regarding flooding by the East Branch of the South Branch of the Kishwaukee which are outside the limits of the study authority. The Corps cannot implement corrective actions for flood problems of the tributary stream located on the east side of the mobile home park, because it is under the minimum size limit.

## EXISTING CONDITIONS

### ENVIRONMENTAL SETTING AND NATURAL RESOURCES

#### Waterway Use

The primary function of the Kishwaukee River and its tributaries is as a drainage outlet for the northern two-thirds of DeKalb County.

#### Hydrologic Analysis

Overbank flooding at the study area is caused by snowmelt or storm water runoff. Damage begins at about the 5-year frequency event. A detailed hydrology and hydraulics analysis of the area is included in Appendix A, Section 1 - Hydraulics.

#### Geology and Soils

In DeKalb County the soils have been derived from Wisconsin Age glacial till, glacial outwash, loess, and alluvium. The Sawmill soil series comprises the surface material of the subject area. This soil is found on nearly level low-lying bottomland which is subject to frequent flooding from the East Branch of the South Branch of the Kishwaukee River. The surface layer and subsoil is typically a silty clay loam. The underlying material is generally clay loam with strata of sand and gravel.

The bedrock beneath the subject area is Ordovician Age and is assigned to the Maquoketa and Galena Groups.

#### Climate

North-central Illinois' climate is humid continental with cold winters and warm summers. Frequent changes in temperature, humidity, cloud cover, and

wind direction are common. Mean monthly temperatures range from around 23.5°F in January to around 74.5°F in July. The average annual temperature is about 49°F; the frost-free season is about 157 days; and annual precipitation is about 35 inches.

#### Air and Noise Quality

Air and noise quality of the area is generally good.

#### Fish and Wildlife

The project area is a trailer park on the eastern edge of the city of Sycamore, Illinois. Adjoining the trailer park or close by are a highway, a golf course, a railroad track, and a commercial agricultural equipment dealer. Trees and brush cover are moderate and mostly in the area of the river. Tracks of a large wading bird and small mammals were observed in the riverbank mud under the highway bridge. The area can be described as semi-urban, of moderate wildlife value, and supporting and attracting small mammals and occasional large migrating birds.

The river (during October) was about 15 to 20 feet wide, 1 to 1-1/2 feet deep, and had a solid substrate of loose, small rocks. The water was fast flowing, clear, and supported abundant population of invertebrate animals indicative of fairly good quality water. The river could thus provide adequate habitat for small flowing stream fish.

#### Threatened and Endangered Species

The following Federally listed threatened or endangered species have historically been found in the project area:

1. Indiana Bat (Myotis sodalis).
2. Peregrine Falcon (Falco peregrinus).
3. Kirtland's Warbler (Dendroica kirtlandii).

#### Indiana Bat

In the winter, Indiana bats use caves as roosting areas. There are no caves in the project area. If Indiana bats were in the area during the summer they would be maternity colonies. The colonies would typically be roosting in wooded riparian habitats under exfoliated bark of dead trees or alternately under loose bark or shagbark hickory (Carya ovata). Indiana bat habitat has been further defined as mature woodlands and preferably 30 meters of woody vegetation on both sides of the stream. The foraging

range required would be from about 0.8 km to 1.2 km along the stream or river. Wooded areas along the river in the vicinity of the project fall far short of fulfilling these requirements. Therefore, Indiana bats would not be expected to be in the project area.

#### Peregrine Falcon

If Peregrine falcons were in the project area they would be using cliffs as nesting sites. There are no cliffs in the project area and, therefore, no Peregrine falcons.

#### Kirtland's Warbler

The Kirtland's warbler breeds in the northern part of the lower peninsula of Michigan. In the winter it might be in the project area and has been reported to use pine woods, broad-leaved scrub, and Australian pine as habitat. These habitat preferences are not found in the project area. Thus, the Kirtland's warbler would not be expected to be found in the project area.

#### HUMAN RESOURCES, DEVELOPMENT, AND ECONOMY

The town of Sycamore is located in central DeKalb County in Illinois. The population has shown a significant increase over the last 20 years. Growth in the sixties was 12.7 percent, and during the seventies over 17 percent to a preliminary population estimate of 9,211 in 1980. The median income in 1970 was \$10,630, only slightly less than the county and state levels. Per capita income of \$3,531, was somewhat higher than at county and state levels. Educational levels in the county showed that most adults had some post high school training. The population is fairly stable. The 1970 census showed that almost half had lived in the county over the last five years. Several small manufacturing firms employed 36 percent of the workforce in 1970. Sycamore is served by Illinois State Highways 23 and 64, and by the CNW railroad line.

The study area lies just east of Sycamore. Two businesses and the Evergreen Mobile Home Park are located there. Since the trailer park is limited to adults only, the affected population residing in the 125 trailers is between 200 and 250 persons. No future business growth is anticipated in the flood plain since county zoning does not allow development in the flood plain. The county has enrolled in the emergency phase of the National Flood Insurance Program.



## CONDITIONS IF NO ADDITIONAL FEDERAL ACTION TAKEN

### ENVIRONMENTAL SETTING AND NATURAL RESOURCES

There are no anticipated changes in the environmental setting or natural resources from those conditions given in the paragraph on Existing Conditions.

### HUMAN RESOURCES, DEVELOPMENT, AND ECONOMY

If no Federal action is taken, the residents will probably continue to live in the flood plain because serious flood damages do not occur every year. The inhabitants and business people there will continue to bear the burden of damages from flooding. Flood insurance will continue to be available. No other significant changes are expected to occur from the existing conditions.

## PROBLEMS, NEEDS, AND OPPORTUNITIES

### THOSE EXPRESSED

The county has expressed concerns about the flooding problem at the Evergreen Village Mobile Home Park, as stated previously under Public Concerns.

### THOSE TO BE ADDRESSED

The problem of flooding and flood-related problems at Evergreen Village Mobile Home Park are addressed. Flood problems in the flood plain to the east of the mobile home park are also investigated.

## PLANNING CONSTRAINTS

It is the policy of the Corps of Engineers to coordinate planning activities with all appropriate and concerned state and Federal agencies. Private citizens and citizens groups are also involved in the planning processes. All state and Federal permits that are required must be obtained.

The planning process provides the basis for selecting one of the developed plans and, if appropriate, recommending it for authorization. The selected plan is the one that is in the best public interest regardless of whether or not it is within the existing authority of the Corps to implement.

Water resource projects planned by the Corps must have an anticipated benefit that exceeds the expected costs of the project. Both monetary and nonmonetary costs and benefits must be accounted for in the evaluation.

Executive Order 11988, dated 24 May 1977, Flood Plain Management, requires the evaluation of the potential effects of project action on flood plains. Actions which directly or indirectly induce commercial or residential growth in the flood plains should not be undertaken unless there is no practical alternative.

Executive Order 11990, dated 24 May 1977, Protection of Wetlands, directs Federal agencies to provide the leadership in minimizing the destruction, loss, or degradation of wetlands. New construction located in wetlands shall not be undertaken or assisted unless there is no practical alternative.

#### PLANNING OBJECTIVES

The specific planning objectives for this study are as follows:

- \* To reduce economic losses associated with flooding of the developed area along the East Branch of the South Branch of the Kishwaukee River where it crosses Highway 64 east of Sycamore, Illinois.

- \* To minimize adverse impacts on the existing natural ecological systems and cultural resources in the study area during and after the implementation of a project.

### SECTION 3 - FORMULATION OF ALTERNATIVE PLANS

The objective of plan formulation is to identify a broad range of management measures that can be considered in the development of sufficient alternative plans to allow selection of a practical and acceptable solution to the problems and needs identified in the study.

#### MANAGEMENT MEASURES

A broad range of structural and nonstructural measures need to be identified and examined as the basis for formulating alternative plans.

Each type measure - whether structural or nonstructural - has its appropriate place in the present and future management of our Nation's flood plains, and the principal task is to find the most appropriate measure for each specific flood hazard and community situation.

#### NONSTRUCTURAL MEASURES

Nonstructural measures provide protection by preventing damages caused by floodwater. Most nonstructural measures are actions taken to individual structures or to land in or around a community. Structures are protected by keeping water out, or raising the structure in place. Specific areas of land are regulated or acquired in fee or easement.

#### STRUCTURAL MEASURES

Structural measures: reservoirs, levees, diversion works, and channel modifications, provide protection to property by controlling floodwaters without modifying individual structures. They deal with the flood, rather than with the structures being protected.

#### PLAN FORMULATION RATIONALE

The plan formulation procedure is a repetitive process designed to identify and evaluate all possible solutions. Its goal is to select the most feasible solution. For a reconnaissance report, the plan formulation procedure is limited to determining if a detailed study is warranted.

The primary goal of the plan formulation process has dual objectives:

- \* To determine reasonable, economically justified projects or programs which solve the pending problem and alleviate the need of the study area residents; and

- \* To shape all economically feasible plans to attain minimal adverse environmental effects, or enhance the environmental quality of the study area.

The achievement of these objectives must be accomplished with a conscious and deliberate effort to improve the regional development of the area and to enhance the social well-being of the study area residents.

## NONSTRUCTURAL ALTERNATIVES

Initial nonstructural considerations included implementing floodproofing and evacuation/relocation. Details of these nonstructural considerations are:

- \* Floodproofing of existing structures whose exteriors are generally impermeable to water can be done by installing temporary or permanent watertight closures to openings such as doorways and windows or by raising structures in place to a higher elevation. Within an existing structure, damageable property can often be relocated to a less dangerous location or protected in place.

- \* Evacuation/relocation acquires title or easement to flood plain land resulting in the relocation of the inhabitants and the removal of existing structures and/or contents from a flood hazard area. One option is to remove both the structure and contents to a flood-free site. The second option is to remove only the contents of a structure and demolish the existing structure.

## STRUCTURAL ALTERNATIVES

Initial structural measures that were considered included an earthfill levee or floodwall system, raising or filling the damage area above the flood elevation, upstream dam and channel modification. Details of these structural alternatives are:

- \* An earthfill levee or concrete floodwall system would keep the floodwater out of the damage area. Part of the mobile home park area and other business areas would be needed to build the levee. Openings in the protection along Highway 64 would be provided to allow vehicular traffic to pass into and out from the businesses behind the protection. These openings would be closed during floods.

- \* Raising the damage area by filling would elevate all the structures above the top of the flood. This would involve building new streets, raising buildings, and moving utilities.

- \* An upstream dam would result in a reservoir to provide an impoundment area for the drainage basin.

- \* Channel modification includes widening the waterway to allow high flows to pass downstream without overbank flooding.

## "NO ADDITIONAL FEDERAL ACTION PROGRAM" ALTERNATIVE

If no additional structural or nonstructural actions are taken, the damage area will remain as it is now. Since county zoning will not allow

additional development in the flood plain, there will be no additional structures susceptible to damage. Serious flood damages do not occur every year. The mobile home park has a 20-percent chance of flooding each year. Therefore, people will continue to live in the flood-prone area. Flood plain zoning and flood insurance would remain in effect.

#### PLANS OF OTHERS

No specific plans were developed or presented by local landowners, public entities, or other agencies. These individuals and organizations did provide input to the development of the study objectives, but did not present a specific plan for controlling flood damages.

#### DEVELOPMENT OF ALTERNATIVE PLANS

The objective of the formulation portion of this study is to fulfill the needs of flood control for DeKalb County east of Sycamore through the logical selection of a plan of action. Such a plan is the result of the screening of all possible solutions and may embody concepts of one or more alternatives. The evaluation of any one alternative is accomplished by giving due consideration to technical, economic, environmental, and other criteria.

#### FORMULATION CRITERIA

In developing a plan to reduce flood damage, standards and procedures which have been set forth in various flood control acts and policies and related regulations established by the Corps of Engineers through experience in the flood protection field have been followed. All plans considered, therefore, were evaluated in accordance with the following criteria.

##### Technical Criteria

The degree of protection afforded by any method of flood damage reduction proposed will be the highest practicable, consistent with economic criteria, safety, and local desirability and acceptance.

##### Economic Criteria

Except for certain environmental or socially related instances, the average annual tangible benefits of a proposal will exceed the annual

charges on the investment. One level of protection analyzed will provide the maximum net benefits.

#### Environmental And Other Criteria

The public health, safety, well-being, and quality of life of the residents of the locality concerned are the prime considerations in the development of a project. Any protective works would be designed to disturb existing natural and cultural features as little as possible. Mitigation for loss of environmental features would be provided to the extent practicable. Opportunities for development of recreational facilities would be provided if desired by local residents. A primarily nonstructural solution will be carried throughout the plan formulation process.

#### ALTERNATIVES CONSIDERED

Several different alternatives were considered for the elimination or control of the flooding problem in the study area. This analysis resulted in the identification of 12 alternatives for assessment and evaluation purposes.

##### STRUCTURAL

#### Alternative A - Earth Levee/Floodwall

Provide an earth levee or floodwall around the mobile home park (see Plate 3).

#### Alternative B - Fill the Study Area

Raise the entire mobile home park out of the flood plain by hauling in fill material.

##### NONSTRUCTURAL

#### Alternative C - Permanent Evacuation/Relocation

Relocate the entire mobile home park from the flood plain. All existing structures will be removed with no new structural development in the study area.

#### Alternative D - Floodproofing

Provide watertight closures to existing building openings such as doorways and windows.

#### Alternative E - Nonstructural Combination

Combine total relocation of the mobile home park and the use of other nonstructural measures to protect businesses remaining in the study area.

NO ADDITIONAL FEDERAL ACTION PROGRAM

#### Alternative F - No Additional Federal Action

Continue with the existing situation with no improvements. Maintain the existing zoning requirements to restrict further development in the study area and continue flood insurance.

#### Alternative G - Dam and Reservoir (structural)

Construction of a dam in the airport road area and the resulting reservoir to provide an impoundment area for the Kishwaukee River and its runoff basin.

#### Alternative H - Widen Kishwaukee River (structural)

Widening the Kishwaukee River to allow high flows to pass downstream without overbanking.

### SECTION 4 - ASSESSMENT AND EVALUATION OF PRELIMINARY PLANS

This section of the report involves a preliminary analysis to identify and measure the likely economic, social, and environmental effects of the possible plans. Each of the alternative plans will be analyzed in relation to the "without project future condition" to determine expected changes.

The alternative plans are described and compared in the following paragraphs.

#### PLAN A - EARTH LEVEE/FLOODWALL

##### DESCRIPTION OF PLAN

This alternative proposes an earthen levee or concrete floodwall be constructed around the mobile home park and tied into the existing railroad embankment on the north. Entrance openings in the levee for traffic between the highway and park can be closed off in times of flooding.

##### IMPACT ASSESSMENT

Plan A would create both positive and negative economic and social effects in the study area. The trailer park would gain protection from flooding up to the design level of protection. Costs associated with flooding, evacuation, and cleanup for floods up to the level of protection, would be eliminated. During the flooding, access to and from the trailer park would be limited to pedestrian or boat travel since the traffic openings in the levee would be sealed. Plan A would also create several adverse economic effects. Approximately 40 trailer lots would be used on the east and west sides of the trailer park for placement of the protection, requiring relocation of approximately 20 families from the occupied lots. Construction of the protection would probably increase flooding problems in other areas, thus transferring economic and social problems elsewhere.

The Fish and Wildlife Service has indicated there are two areas of impact that may result in the project area from construction of an earth levee or concrete floodwall protecting the trailer park. First, the flood waters would be confined to a smaller area and may increase in velocity and scour the stream. This may result in degradation of aquatic habitat and biota. Secondly, in protecting the trailer park from the stream overtopping its banks, valuable streamside vegetation may be lost. Streamside vegetation is a vital link in the aquatic food web. It provides a major source of organic material and cools the stream through shading.

##### EVALUATION

The occupants of the trailer park would have limited access to and from the park during flooding. It is Corps policy to avoid recommending flood-proofing measures that would leave occupied buildings inaccessible during a flood, thereby extending the public commitment for continuing emergency



assistance. For this reason, first costs, annual costs, and annual benefits are not presented. This plan could also lead to increased flooding at other locations in the flood plain. Concerning the environment, this plan may adversely affect fish and wildlife resources. For these reasons, this plan is not considered further.

#### MITIGATION/IMPLEMENTATION

Neither a mitigation plan nor an implementation plan was developed for Plan A.

#### PLAN B - FILLING THE TRAILER PARK

##### DESCRIPTION OF PLAN

This alternative proposes raising the elevation of the entire park by hauling in fill. Existing buildings, streets, and utilities would need to be demolished or temporarily relocated, and new streets, buildings and utilities constructed on top of the new fill.

##### IMPACT ASSESSMENT

Positive economic benefits would result from the elimination of flooding, evacuation, and clean-up costs. Negative economic benefits would come from any increased flooding of other property. This was not analyzed for the reconnaissance level study. Socially, disruptions in daily life would be eliminated by this alternative after construction. However, access to the park could still be restricted during flooding by the floodwaters surrounding the park. Plan C would create several adverse effects. This alternative would be most harmful to the environment as all existing trees would need to be removed. Economically, Plan C requires all existing buildings and streets to be removed and then rebuilt on the fill material at a higher elevation. The useable size of the park would be reduced. After the location of the borrow pit for the fill is determined, environmental impacts would have to be assessed. Raising the entire park would create new or increased flooding problems elsewhere. The economic and social problems associated with the flood would be transferred elsewhere and the problem would not be solved. During construction, all trailers would have to be relocated to a temporary site. At project completion the mobile homes would be moved back. Residents would need to go through the moving process twice causing economic and social hardships.

The Fish and Wildlife Service has indicated there are two areas of impact that may result in the project area from filling the trailer park. First, the flood waters would be confined to a smaller area and may increase in

velocity and scour the stream. This may result in a degradation of aquatic habitat and biota. Second, in protecting the trailer park from the stream overtopping its banks, valuable streamside vegetation may be lost. Streamside vegetation is a vital link in the aquatic food web. It provides a major source of organic material and cools the stream through shading.

#### EVALUATION

This plan would provide flood protection against floods up to the standard project level. The occupants of the trailer park would still have limited access to and from the park during flooding. This plan may adversely affect the environment in the project area. It is the Corps policy to avoid recommending floodproofing measures that would leave occupied buildings inaccessible during a flood, thereby extending the public commitment for continuing emergency assistance. For this reason, first costs, annual costs, and annual benefits are not presented. This plan could lead to increased flooding at other locations in the flood plain. Therefore, this plan is not considered further.

#### MITIGATION/IMPLEMENTATION

Neither a mitigation plan nor an implementation plan was developed for Plan B.

#### PLAN C - PERMANENT EVACUATION/RELOCATION

##### DESCRIPTION OF PLAN

This plan calls for the permanent evacuation/relocation of the mobile homes and park from the flood plain. Public Law 91-646, the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, provides certain instances where mobile homes will be acquired. Due to age and/or size of the mobile homes in Evergreen Village Mobile Home Park and due to unavailability of sufficient spaces in existing mobile home parks in the area to accommodate all the mobile homes, it is considered all the mobile homes in the park would be acquired and that some of the families will relocate to mobile home parks in the area while the others may purchase or rent conventional replacement housing.

## IMPACT ASSESSMENT

Plan C eliminates all future flood-related costs to residents of the Evergreen Village Mobile Home Park; however, flood damages will still occur to the businesses remaining in the study area to the east of the mobile home park. With the elimination of flood damage, the social impact for the park residents may be positive or negative, depending on their feelings about relocation. Public Law 91-646 provides for advisory assistance and monetary benefits to ease the impact of relocation on displaced persons. The Fish and Wildlife Service has indicated that relocation may be beneficial or detrimental to the natural resources of the project area, depending on future use of the property.

In relocating the mobile home park, if the old site is enhanced to a habitat value greater than that of the new site, a net gain in habitat value would occur. Conversely, if the mobile home park was relocated and the old site was used for parking or some other type of development, a net habitat loss would result valued at the loss of the new site plus any further degradation to the existing habitat near the old mobile home park.

## EVALUATION

This plan would provide flood protection to the residents of the mobile home park since they would be removed from the flood plain. There would be no access problems during flooding. The occupants remaining in the flood plain, such as the businesses to the east of the mobile home park, would continue to have flood problems. The environmental impact of moving the residents from the mobile home park is not expected to be significant, since Public Law 91-646 provides that displaced persons will not be required to move until assurance is given that adequate replacement housing is available. The estimated first costs for this plan are \$2,633,663. The estimated annual costs are \$199,895, while the estimated annual benefits are \$445,000. There are no residual damages for the mobile home park area. There would be no negative benefits from increased flood damage to other property with this plan.

## MITIGATION

The mitigation measures proposed for this plan include reestablishment of erosion resistant ground cover with appropriate vegetation as the mobile homes are removed and the existing ground cover is disturbed. Removal and disposal of utilities, particularly the sanitary sewer system, is necessary. Parts of some utilities may be abandoned in place. Finally, the property would be converted to an agricultural or recreational area compatible with flood plain uses and desires of the county.

## IMPLEMENTATION

The implementation of this plan would require cooperation between Federal, State, and local governments. The mobile home park property and mobile homes would be purchased by the local, State, or Federal Government.

Displaced persons, who meet the requirements of Public Law 91-646, would be reimbursed for moving expenses, would be paid replacement housing payments, and, in some cases, replacement business payments. The cost of the relocation plan would be based on a 20-percent non-Federal and an 80-percent Federal distribution of the construction and land costs.

### PLAN D - FLOODPROOFING

#### DESCRIPTION OF PLAN

This alternative involves structural changes to existing structures. It is a nonstructural plan because it prevents damage by floodwater when flooding occurs but does not control the floodwater. Watertight closures are to be provided to close doorways and windows. These closure panels can be either temporary or permanent. Floodproofing in the mobile home park would consist of raising the homes above the flood level. However, Corps policy prevents participating in floodproofing buildings where access is restricted during flooding. Therefore, this alternative will floodproof only the business area to the east. Other actions must be taken to prevent flood damage to utility systems such as sanitary sewage lines, electrical distribution systems, and natural gas distribution systems.

#### IMPACT ASSESSMENT

This plan has minor impact on the flood problem of the mobile home park. This plan is primarily directed toward reducing damages incurred by the businesses located in the study area. Plan D does not prevent flooding, but minimizes the damages caused by flooding. There will continue to be the economic impact on the businesses closed during the flooding, but the damages caused will be reduced.

#### MITIGATION

Mitigation actions will need to be determined. Most actions will be to existing buildings and few environmental impacts are anticipated.

## IMPLEMENTATION

The implementation of this plan would require cooperation between Federal, state, and local governments and the effected residents. The approved floodproofing measures would be cost shared on a basis similar to Plan C - Permanent Evacuation/Relocation. Plan D does not sufficiently reduce flood damages in the study area and would only be implemented as part of a complete plan, such as Plan E.

### PLAN E - NONSTRUCTURAL COMBINATION

#### DESCRIPTION OF PLAN

Plan E is a comprehensive plan of nonstructural alternatives. This plan calls for the evacuation of that portion of the flood plain used for the mobile home park, and for the protection of businesses remaining in the study area by zoning, floodproofing, and flood insurance. These have been discussed previously under individual nonstructural plans.

#### IMPACT ASSESSMENT

This plan eliminates all future flood-related costs to residents of the Evergreen Village Mobile Home Park. The social impact for the park residents may be positive, with the elimination of flood damage, or negative, depending on their feelings about relocation. Public Law 91-646, the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, provides for advisory assistance and monetary benefits to ease the impact of relocation on displaced persons.

The occupants remaining in the flood plain, such as the businesses to the east of the mobile home park, would continue to be exposed to the economic impact of closed businesses during flooding, but would receive less flood damage due to the protection and assistance associated with zoning, floodproofing, and flood insurance.

The Fish and Wildlife Service has indicated that evacuation may be beneficial or detrimental to the natural resources of the project area, depending on future use of the mobile home park property.

In relocating the mobile home park, if the old site is enhanced to habitat value greater than that of the new site, a net gain in habitat value would occur. Conversely, if the mobile home park was relocated and the old site was used for parking or some other type of developemnt, a net habitat loss would result, valued at the loss of the new site plus any further degradation to the existing habitat near the old mobile home park.

## EVALUATION

This plan would provide flood protection to the residents of the mobile home park since they would be removed from the flood plain. Floodproofing of the remaining businesses in the study area flood plain, along with continued enforcement of county zoning and flood insurance regulations would minimize damages caused by future high-frequency flooding. Zoning, floodproofing, and flood insurance do not impact on fish and wildlife resources. The costs and benefits of floodproofing are anticipated to be positive. The environmental impact of moving the residents from the mobile home park is not expected to be significant, as Public Law 91-646 provides that displaced persons will not be required to move until assurance is given that adequate replacement housing is available.

## MITIGATION

Mitigation measures for Plan E are similar to those proposed for Plan C - Permanent Evacuation/Relocation. Most actions for floodproofing will be to existing buildings with few anticipated environmental impacts. No mitigation plans are required for flood insurance and zoning.

## IMPLEMENTATION

The implementation of this plan would require cooperation between Federal, State, and local governments and the effected businesses. The mobile home park property and mobile homes would be purchased by the local, State, or Federal Government. Displaced persons, who meet the requirements of Public Law 91-646, would be reimbursed for moving expenses, would be paid replacement housing payments, and, in some cases, business payments.

Zoning and flood insurance programs are already in effect in DeKalb County. The evacuation and floodproofing plans would be on a cost-sharing basis.

## PLAN F - NO ADDITIONAL FEDERAL ACTION

## DESCRIPTION OF PLAN

This alternative continues with the existing situation with no Federal action.

## IMPACT ASSESSMENT

Social and economic impacts will continue to be unfavorable. Residents will continue to live in the area, enduring nuisance flooding and damages. The county would not allow future development in the flood plain by continuing to enforce the zoning laws. The possible health hazard of a flooded sewage treatment plant would remain a negative benefit. Future development in the flood plain will be prevented by existing zoning, and flood insurance will be available for existing development.

## EVALUATION

The no action alternative does not meet the stated planning objective. However, this alternative is presented in the event that Federal participation is not approved or not funded. Since there are no changes, there are no environmental impacts.

## PLAN G - DAM AND RESERVOIR

### DESCRIPTION OF PLAN

Plan G proposes that a floodwater retention structure be constructed in the Airport Road area of the Kishwaukee River. This will result in the creation of a reservoir in which to impound floodwater and runoff in the Kishwaukee River Basin.

### IMPACT ASSESSMENT

This plan will benefit the study area by impounding potential floodwaters in a reservoir. However, the dam and resulting reservoir would require removal of approximately 5,240 acres of prime farmland from production and the evacuation of approximately 40 homesteads. Recreation, water supply, hydroelectric power, and other project purposes may be feasible; though they would need to be studied in greater detail.

### EVALUATION

Initial studies did not show this plan to be economically, socially, or environmentally acceptable. No further study is anticipated on this plan.

Immediate negative benefits would be experienced, i.e., the loss of farmlands and homes. However, there are several possible positive benefits that would be evaluated if a feasibility study is authorized by Congress.

The Fish and Wildlife Service has indicated that the dam and reservoir plan may provide an excellent opportunity to enhance fish and wildlife resources and recreation. For a seasonal reservoir, the area could be managed for park, recreation, and wildlife feeding habitat. Ground-nesting habitat should be discouraged. A year-round reservoir would provide fishery benefits as well as an increase in the recreational value of the area. However, fish and wildlife resources could realize a net loss if the dam and reservoir alternative significantly affected valuable wetland, riparian, or stream habitat.

#### PLAN H - WIDEN KISHWAUKEE RIVER

##### DESCRIPTION OF PLAN

Alternative H consists of widening the channel of the Kishwaukee River to such an extent that high flows may pass without overtopping its banks and causing flooding.

##### IMPACT ASSESSMENT

This plan will benefit the study area by allowing passage of Kishwaukee River flood flows without flood damage. However, the widening would require approximately 50 acres of land adjacent to the riverbank in just the study area and would not prevent the nuisance floods caused by the Tributary A. Therefore, the social and economic impacts associated with the tributary would remain. Short-term water quality in the Kishwaukee River would be affected during the construction period. Other long-term environmental damages would result.

##### EVALUATION

Initial studies indicate that this plan is not economically, socially, or environmentally acceptable.

The US Fish and Wildlife Service generally opposes stream channelization and considers widening the Kishwaukee River as one of the least desirable alternatives. These involve the removal and degradation of aquatic habitat and biota. Studies have shown channelized sections of streams to be less productive than nonchannelized sections. The US Fish and Wildlife Service would oppose widening the Kishwaukee River. No further study is anticipated on this plan.



## SECTION 5 - COMPARISON OF ALTERNATIVE PLANS

### COMPARATIVE EVALUATION OF ALTERNATIVES

The existing flood conditions in DeKalb County, east of Sycamore, the associated problems and needs, and possible alternative solutions to alleviate these problems and needs have been emphasized to this point. A recommended course of action was developed by analysis and comparison of alternatives according to four basic considerations of water resource planning: national economic development, environmental quality, regional development, and social well-being. A matrix of effects is shown in Tables 1 and 2. A summary evaluation of the alternatives follows.

TABLE 1

#### Listing Of Alternatives

<u>Alternative</u>	<u>Description</u>	<u>Type Alternative</u>
A	Earth Levee/Floodwall	(Structural)
B	Filling the Trailer Park	(Structural)
C	Permanent Evacuation/Relocation	(Nonstructural)
D	Floodproofing	(Nonstructural)
E	Nonstructural Combination	(Nonstructural)
F	No Additional Federal Action	(Without project plan)
G	Dam and Reservoir	(Structural)
H	Widen Kishwaukee River	(Structural)

TABLE 2  
Comparison of Alternatives

Alternative	First Cost(\$)	Annual Cost (\$)	Annual Benefits (\$)	EQ	NED	Social Well-Being
A	*Not calculated	NC	NC	unfavorable	favorable	unfavorable
B	Not calculated	NC	NC	unfavorable	unfavorable	unfavorable
C	2,633,663	199,895	445,000	favorable (BCR = 2.23)	favorable	favorable
D	Not calculated	NC	NC	favorable	Unknown	favorable
E	**To be determined	TBD	TBD	favorable	Unknown	favorable
F	N/A	N/A	N/A	favorable	unfavorable	unfavorable
G	Not calculated	NC	NC	unknown	unknown	unknown
H	Not calculated	NC	NC	unknown	unknown	unknown

\* Not Calculated - NC

\*\* To be determined - TBD

## RATIONALE FOR PLANS ELIMINATED

As shown in Table 2, Comparison of Alternatives, Plan C - Permanent Evacuation/Relocation, Plan D - Floodproofing, and Plan E - Nonstructural Combination, have favorable environmental quality (EQ), National Economic Development (NED), and social well-being qualities. These plans are considered to be the most complete, environmentally and economically feasible plans warranting further study.

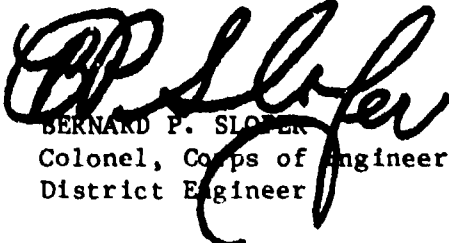
However, Dekalb County has expressed unwillingness to participate in the financial responsibilities of these plans because of the possible, high non-Federal costs. See Appendix C, Pertinent Correspondence.

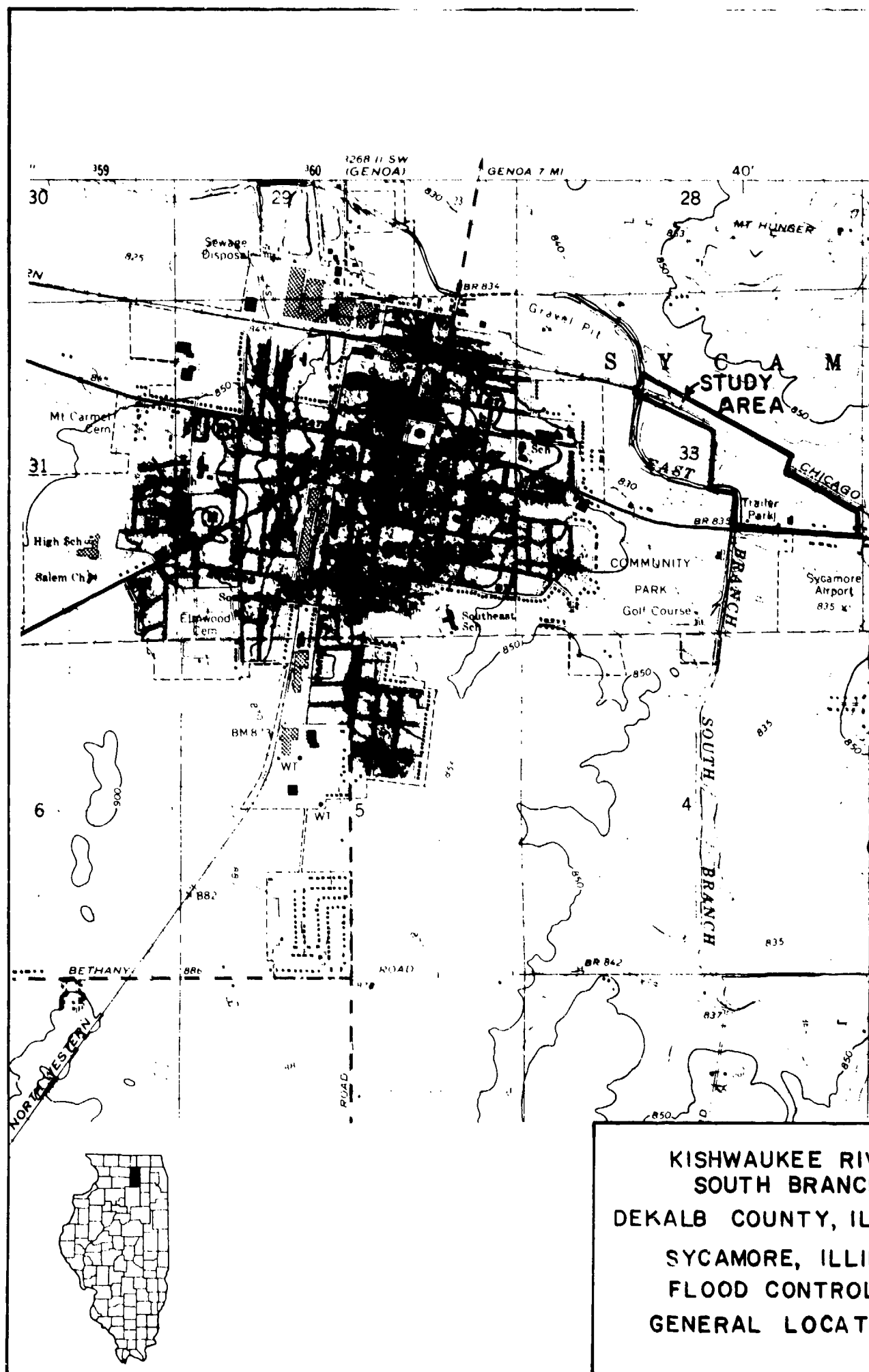
## SECTION 6 - CONCLUSIONS

Significant flooding problems exist along the East Branch of the South Branch of the Kishwaukee River. This study identified three alternative plans which warrant further study to alleviate flood problems of the Evergreen Village Mobile Home Park and the flood plain east of the park. The local sponsor has indicated this project has a very low priority in relation to the large size of the local funding requirement. The local sponsor has recommended against the additional expenditure of Federal funds for this project.

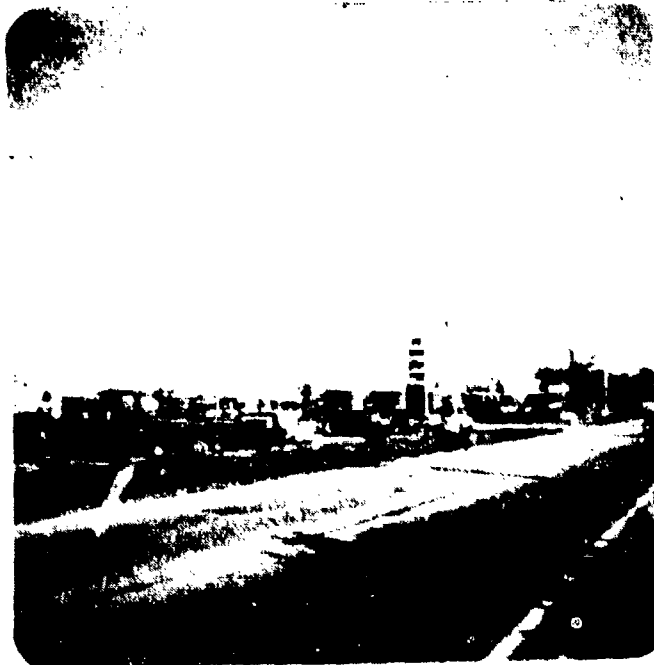
## SECTION 7 - RECOMMENDATION

In view of the report findings, I recommend that further Federal action for DeKalb County, east of the city limits of Sycamore, Illinois, under Section 205 of the 1948 Flood Control Act, as amended, be terminated.

  
BERNARD P. SLOPER  
Colonel, Corps of Engineers  
District Engineer



KISHWAUKEE RIVER  
SOUTH BRANCH  
DEKALB COUNTY, ILLINOIS  
SYCAMORE, ILLINOIS  
FLOOD CONTROL  
GENERAL LOCATION

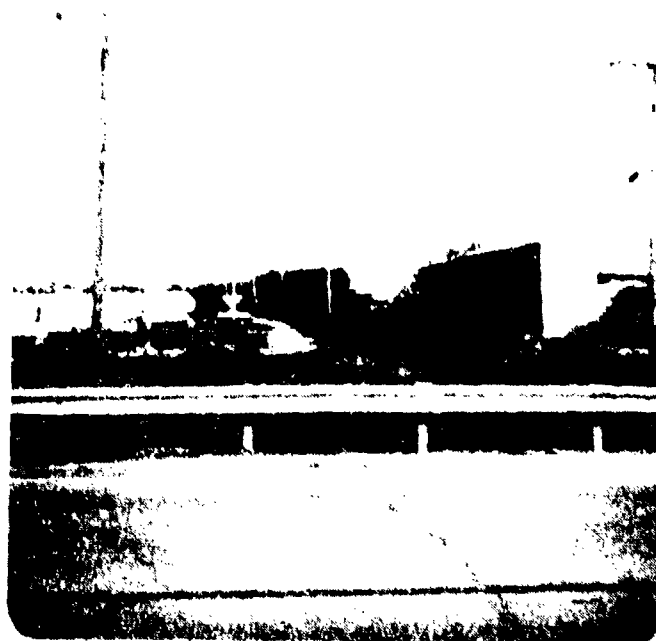


BUSINESSES LOCATED EAST OF MOBILE HOME PARK



CONDITION INSIDE MOBILE HOME PARK

KISHWAUKEE RIVER  
SOUTH BRANCH  
DEKALB COUNTY, ILLINOIS  
SYCAMORE, ILLINOIS  
FLOOD CONTROL  
EXISTING CONDITIONS

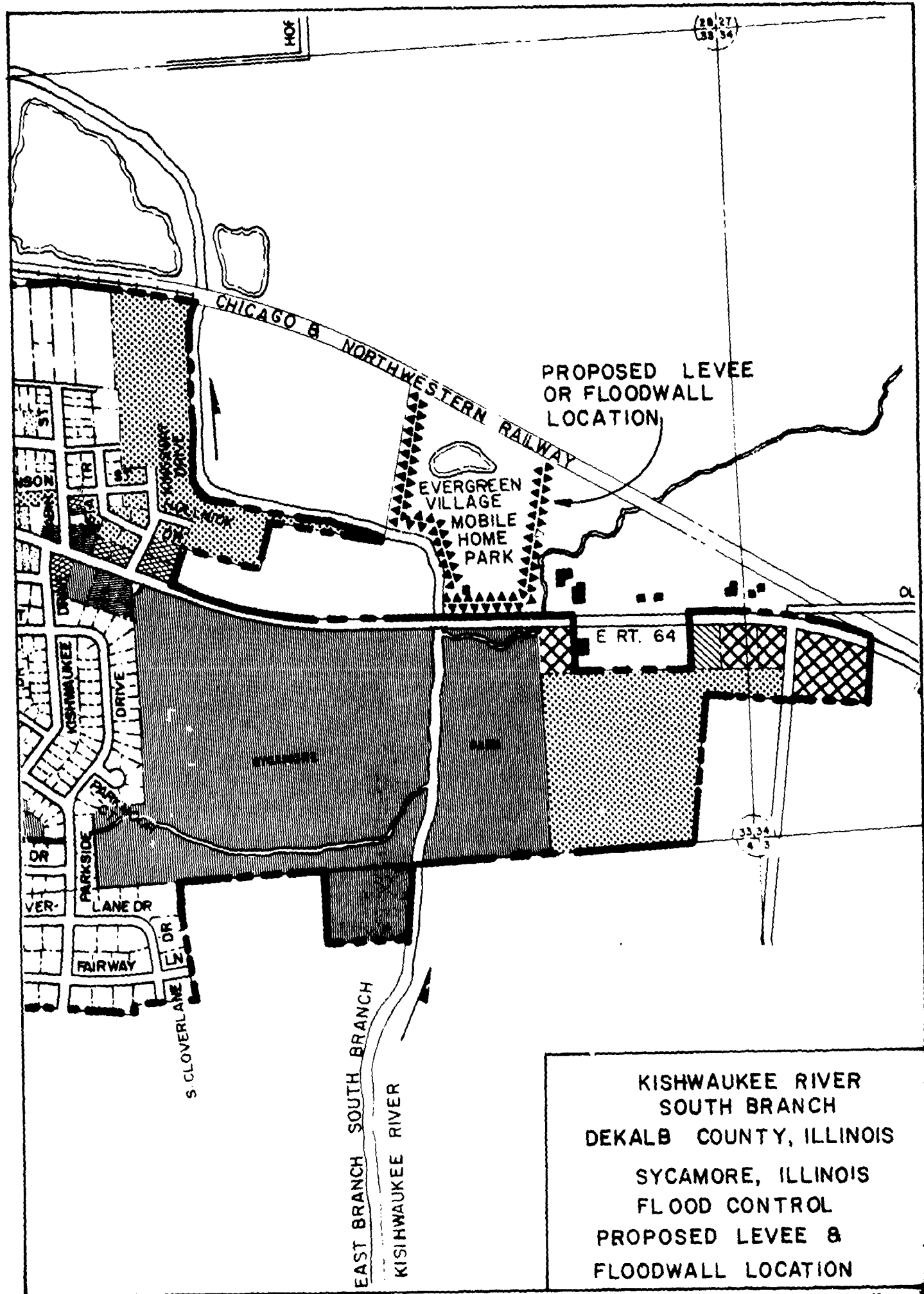


TRIBUTARY 'A' LOOKING UPSTREAM BETWEEN WEST  
EDGE OF MOBILE HOME PARK & BUSINESSES.



EAST BRANCH OF THE SOUTH BRANCH OF KISHWAUKEE  
RIVER FLOWING ADJACENT TO MOBILE HOME PARK

KISHWAUKEE RIVER  
SOUTH BRANCH  
DEKALB COUNTY, ILLINOIS  
SYCAMORE, ILLINOIS  
FLOOD CONTROL  
EXISTING CONDITIONS



KISHWAUKEE RIVER  
SOUTH BRANCH  
DEKALB COUNTY, ILLINOIS  
SYCAMORE, ILLINOIS  
FLOOD CONTROL  
PROPOSED LEVEE &  
FLOODWALL LOCATION

HYDRAULICS

A  
P  
P  
E  
N  
D  
I  
X  
A



SOUTH BRANCH KISHWAUKEE RIVER NEAR SYCAMORE  
DEKALB COUNTY, ILLINOIS

RECONNAISSANCE REPORT FOR  
SECTION 205 FLOOD CONTROL PROJECT

APPENDIX A

HYDRAULICS

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A-1	South Branch Kishwaukee River at Fairdale, Illinois, Gage 05439500, Frequency-Discharge Curve
A-2	East Branch Kishwaukee River at Sycamore, Illinois, Frequency-Discharge Curve
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SOUTH BRANCH KISHWAUKEE RIVER NEAR SYCAMORE  
DEKALB COUNTY, ILLINOIS

RECONNAISSANCE REPORT FOR  
SECTION 205 FLOOD CONTROL PROJECT

APPENDIX A

HYDRAULICS

A field visit was made on 24 October 1979 to Sycamore, Illinois, to investigate flooding along the East Branch of the South Branch of the Kishwaukee River and at Tributary A to the Kishwaukee River at the Evergreen Village Mobile Home Park. The Evergreen Village Mobile Home Park is a low-lying area subject to flooding from both the Kishwaukee River and Tributary A.

The frequency analysis for the Kishwaukee River was developed using the stream gage, number 05439500 South Branch Kishwaukee River, near Fairdale, Illinois (Table A-1) and the square root of the drainage areas method (Table A-2). The frequency analysis for Tributary A was developed using "Techniques for Estimating Magnitude and Frequency of Floods in Illinois," US Geological Survey Water Resource Investigation 77-117 (Table A-3).

The hydraulic analysis for the Kishwaukee River was developed using the profiles presented in the "South Branch Kishwaukee River Flood Plain Information," June 1971, and the hydrologic analysis explained above. The hydraulic analysis for Tributary A was developed using the HEC-2 computer program (Plates 1 through 8).

The results of the investigation reveal that the Evergreen Village Mobile Home Park receives flooding from the Kishwaukee River or Tributary A from a storm with a 5-year return period or greater. The most likely solution to eliminate the flooding problems would be to relocate the mobile home park.

Protection from Tributary A could be achieved in a number of ways:

- a. Reduce the size of the opening under the abandoned railroad grade, reducing the flow to the park.
- b. Create a diversion canal along the north side of the railroad grade, diverting the water into the Kishwaukee River.
- c. Place a small levee along the east side of the mobile home park and widen the channel.

All of these solutions would either create new or worsen existing problems on adjoining land but easements or variances may be worked out with all involved parties.

Protection from flooding from high frequency storms along the Kishwaukee River would be limited to the construction of a reservoir. One possible site would be in the vicinity of Airport Road. Levee construction for protection from the 1-percent storm would be unfeasible because of the extent of flooding and the proximity of the mobile home park to Highway 64 and the Kishwaukee River. Levee construction may be feasible for protection from low frequency storms.

TABLE A-1

Frequency Analysis, Kishwaukee River, Stream Gage Method

<u>Peak Flows with Expected Probability*</u>	<u>Exceedance Probability</u>
14,300	.002
12,800	.005
11,700	.010
10,500	.020
9,250	.040
7,450	.100
5,980	.200
3,700	.500
2,090	.800
1,480	.900
1,080	.950
556	.990
Mean Logarithm	3.5419
Standard Deviation	.2690
Computed Skew	-.8208
Generalized Skew	-.6000
Adopted Skew	-.6000

\*Discharge values developed using "HECWRC" computer program

TABLE A-2

Frequency Analysis, Kishwaukee River, Square Root Method

$$Q_{\text{unknown}} = \sqrt{\frac{\text{D.A. unknown}}{\text{D.A. known}}} Q_{\text{known}}^*$$

$$Q_u = \sqrt{\frac{126}{387}} Q_k$$

$$Q_{500} = \sqrt{\frac{126}{387}} \quad 14,300 = 8,160 \text{ c.f.s.}$$

$$Q_{100} = \sqrt{\frac{126}{387}} \quad 11,700 = 6,675 \text{ c.f.s.}$$

$$Q_{50} = \sqrt{\frac{126}{387}} \quad 10,500 = 6,000 \text{ c.f.s.}$$

$$Q_{25} = \sqrt{\frac{126}{387}} \quad 9,240 = 5,275 \text{ c.f.s.}$$

$$Q_{10} = \sqrt{\frac{126}{387}} \quad 7,450 = 4,250 \text{ c.f.s.}$$

$$Q_5 = \sqrt{\frac{126}{387}} \quad 5,980 = 3,410 \text{ c.f.s.}$$

\*Conversion of flows from South Branch Kishwaukee River to East Branch -  
South Branch Kishwaukee River

TABLE A-3

Frequency Analysis, Tributary A

## Drainage Area Computations (A)

$$\begin{array}{rcl}
 15.71 \text{ in}^2 & - & 0.00 \text{ in}^2 = 15.71 \text{ in}^2 \\
 31.44 \text{ in}^2 & - & 15.71 \text{ in}^2 = 15.73 \text{ in}^2 \\
 & & \text{Avg } 15.72 \text{ in}^2
 \end{array}$$

$$15.72 \text{ in}^2 \times 0.144 \frac{\text{mi}^2}{\text{in}^2} = 2.26 \text{ mi}^2$$

## Channel Length (L)

$$L = 19,500' = 3.69 \text{ mi}$$

## Elevation at

$$\begin{array}{rcl}
 10\% & - & 837.0' \text{ m.s.l.} \\
 85\% & - & 895.0' \text{ m.s.l.} \\
 & & \underline{58.0' \text{ m.s.l.}}
 \end{array}$$

## Slope (S)

$$\frac{58'}{3.69 \text{ mi}} = 15.72 \frac{\text{ft}}{\text{mi}}$$

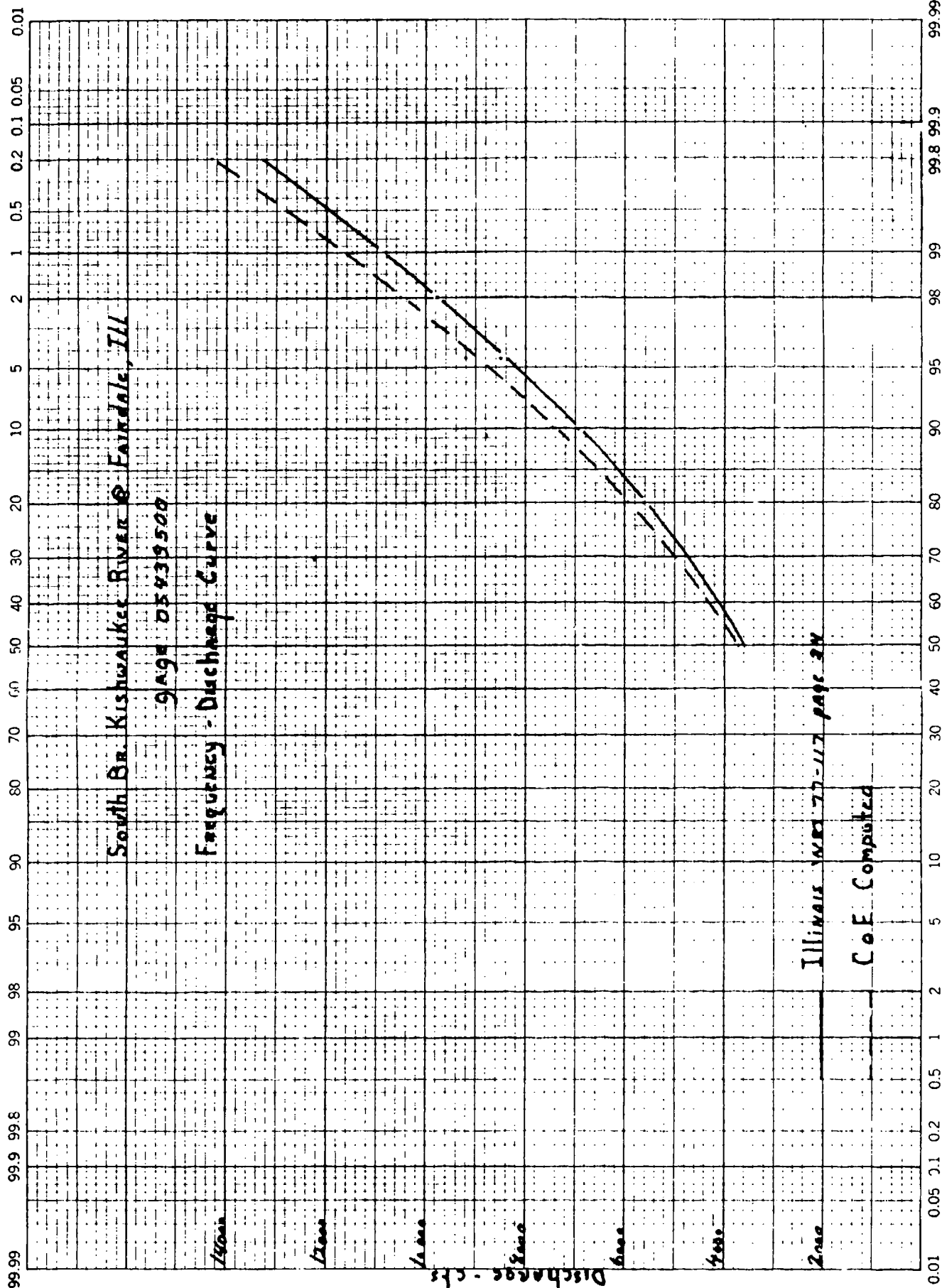
## Rainfall Intensity (I)

$$\begin{array}{rcl}
 I @ 88^\circ 37' 30'' \text{ Long.} & = & 2.8'' \\
 & & 42^\circ 00' 00'' \text{ Lat.}
 \end{array}$$

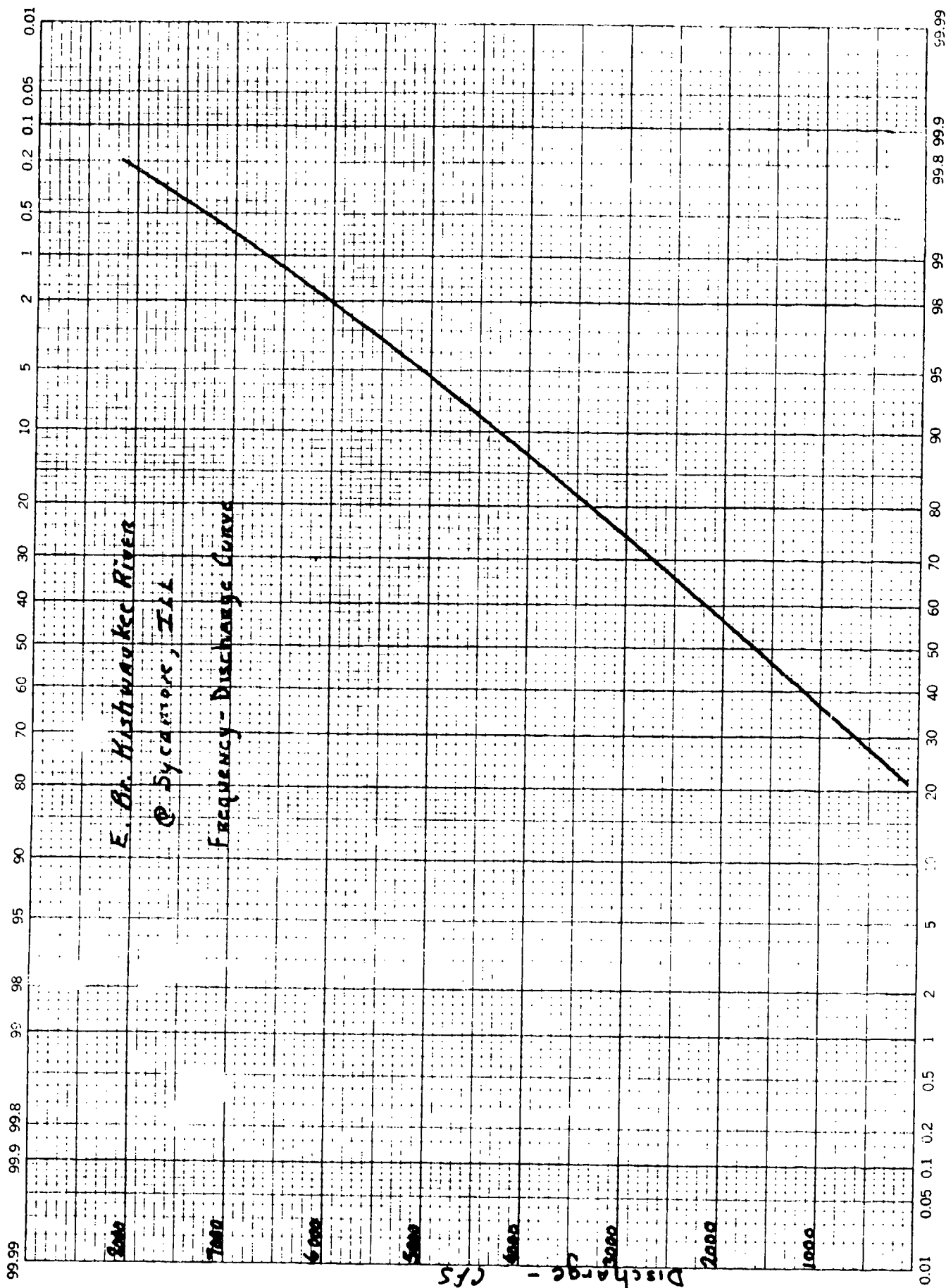
## Areal Factor (AF)

$$AF = 1.11$$

$$\begin{array}{rcl}
 Q_2 & = & 42.7 A^{0.776} S^{0.466} (I-2.5)^{.834} AF = 118 \text{ c.f.s.} \\
 Q_5 & = & 71.1 A^{0.769} S^{0.485} (I-2.5)^{.833} AF = 206 \text{ c.f.s.} \\
 Q_{10} & = & 90.8 A^{0.767} S^{0.494} (I-2.5)^{.833} AF = 269 \text{ c.f.s.} \\
 Q_{25} & = & 115 A^{0.764} S^{0.504} (I-2.5)^{.834} AF = 349 \text{ c.f.s.} \\
 Q_{50} & = & 134 A^{0.763} S^{0.510} (I-2.5)^{.836} AF = 412 \text{ c.f.s.} \\
 Q_{100} & = & 152 A^{0.762} S^{0.515} (I-2.5)^{.836} AF = 474 \text{ c.f.s.} \\
 Q_{500} & = & 191 A^{0.761} S^{0.528} (I-2.5)^{.837} AF = 616 \text{ c.f.s.}
 \end{array}$$



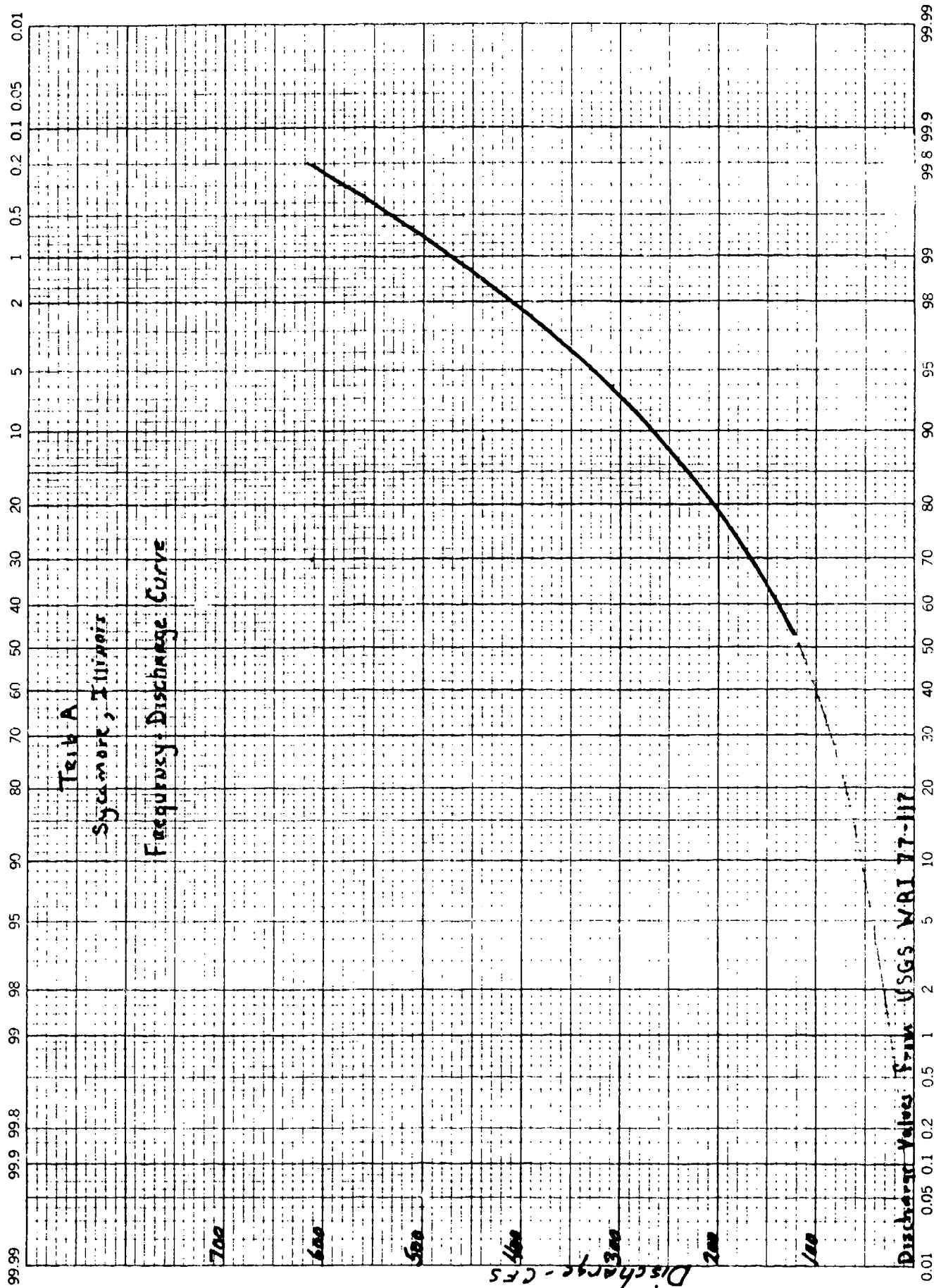
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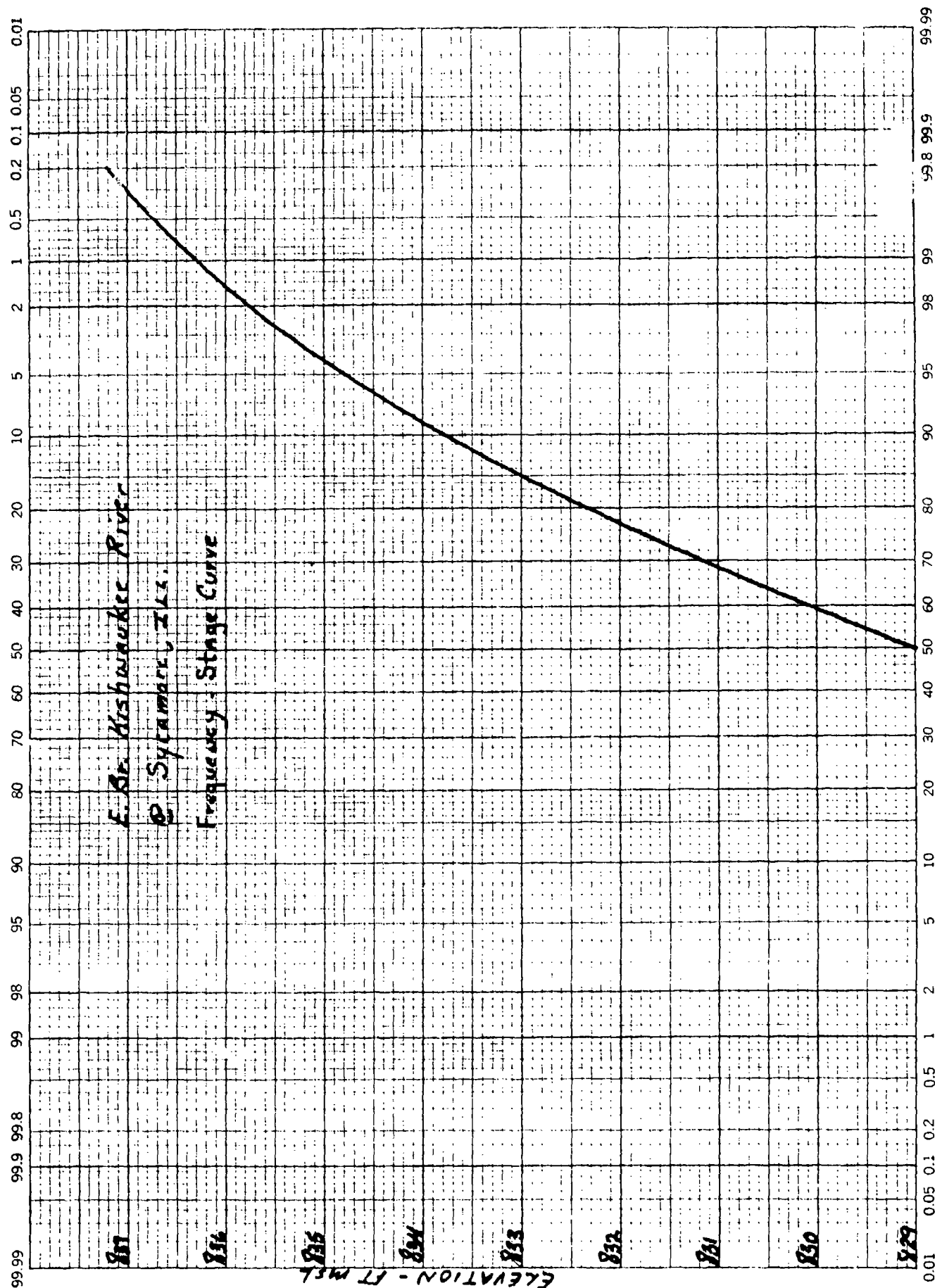
KOE PRODUCEMENTS & 30 DIVISIONS  
KEUFFEL & ESSER CO. MADE IN U.S.A.

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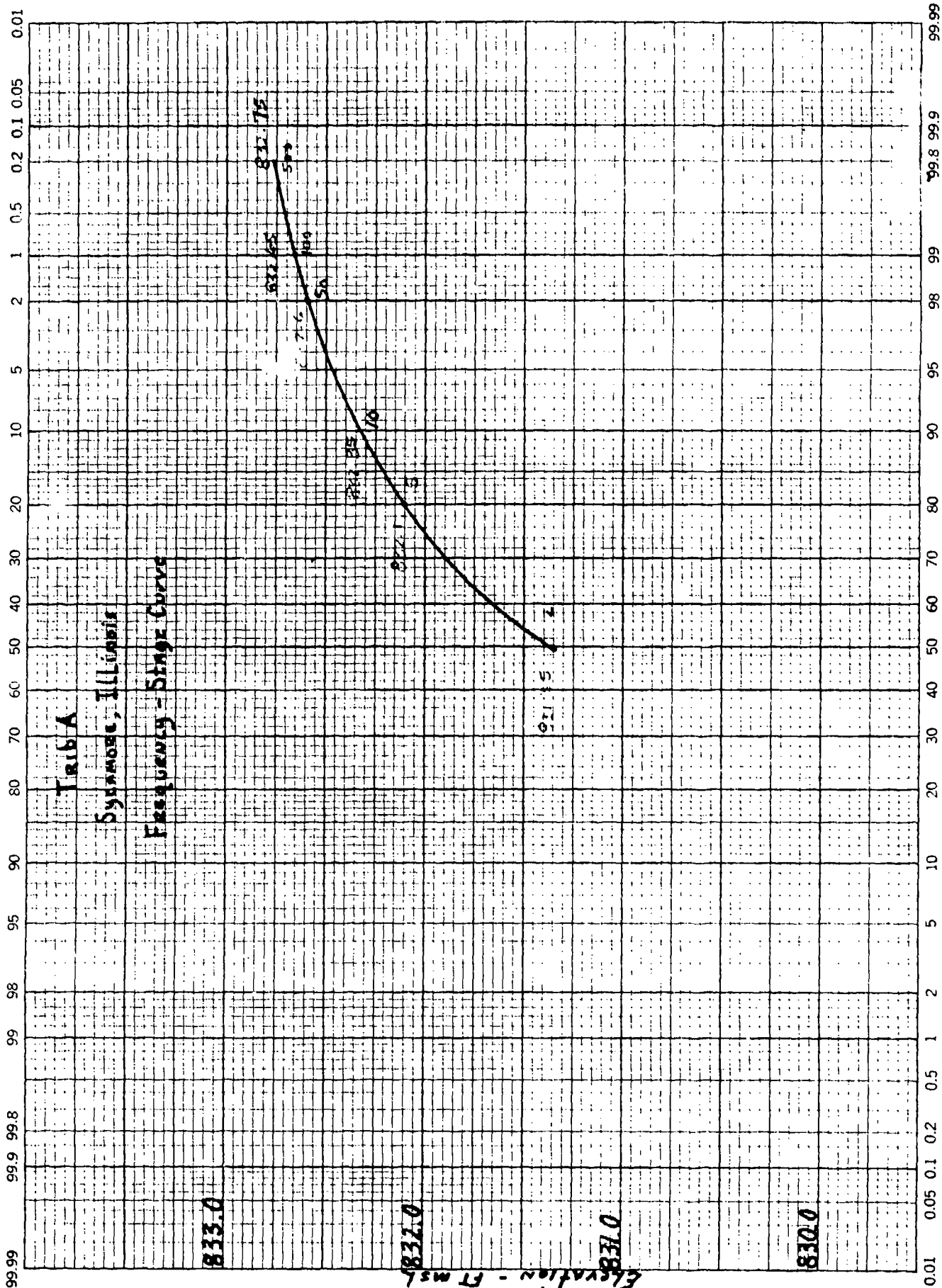
KOE PROBABILITY & PERCENTILES  
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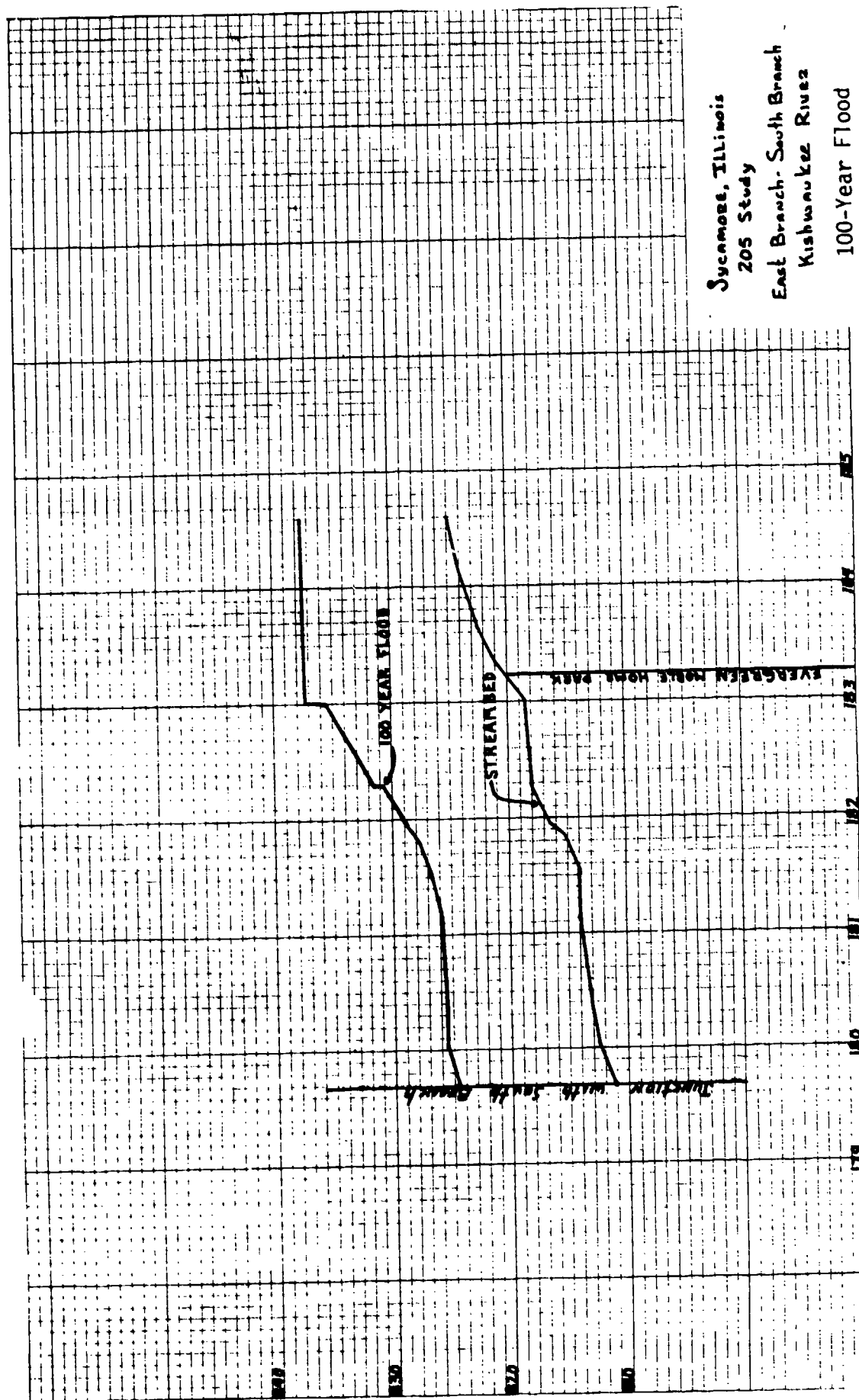


K-2 PROBABILITY & 90 DIVISIONS  
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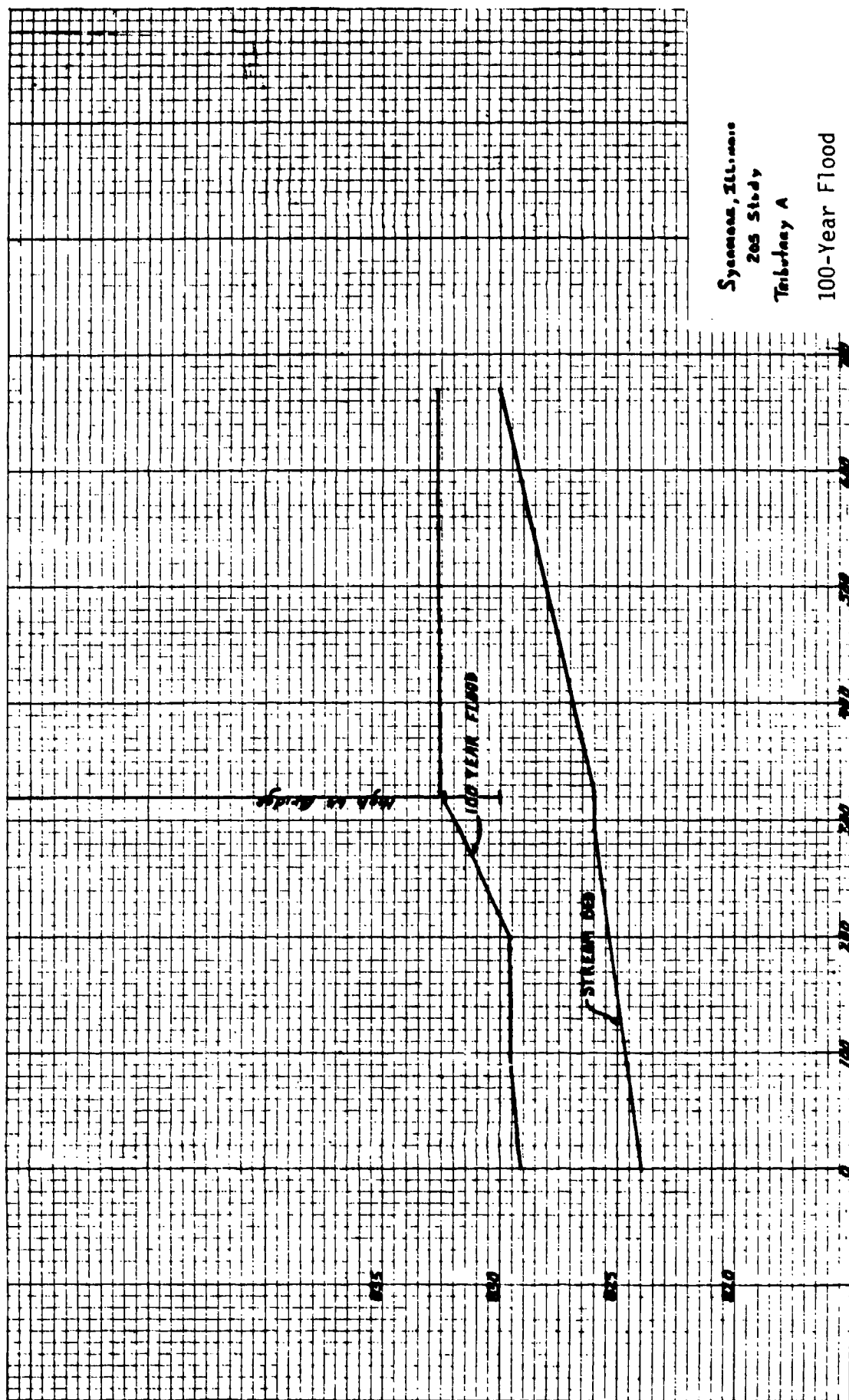
Sycamore, Illinois  
 205 Study  
 East Branch - South Branch  
 Kishwaukee River  
 100-Year Flood



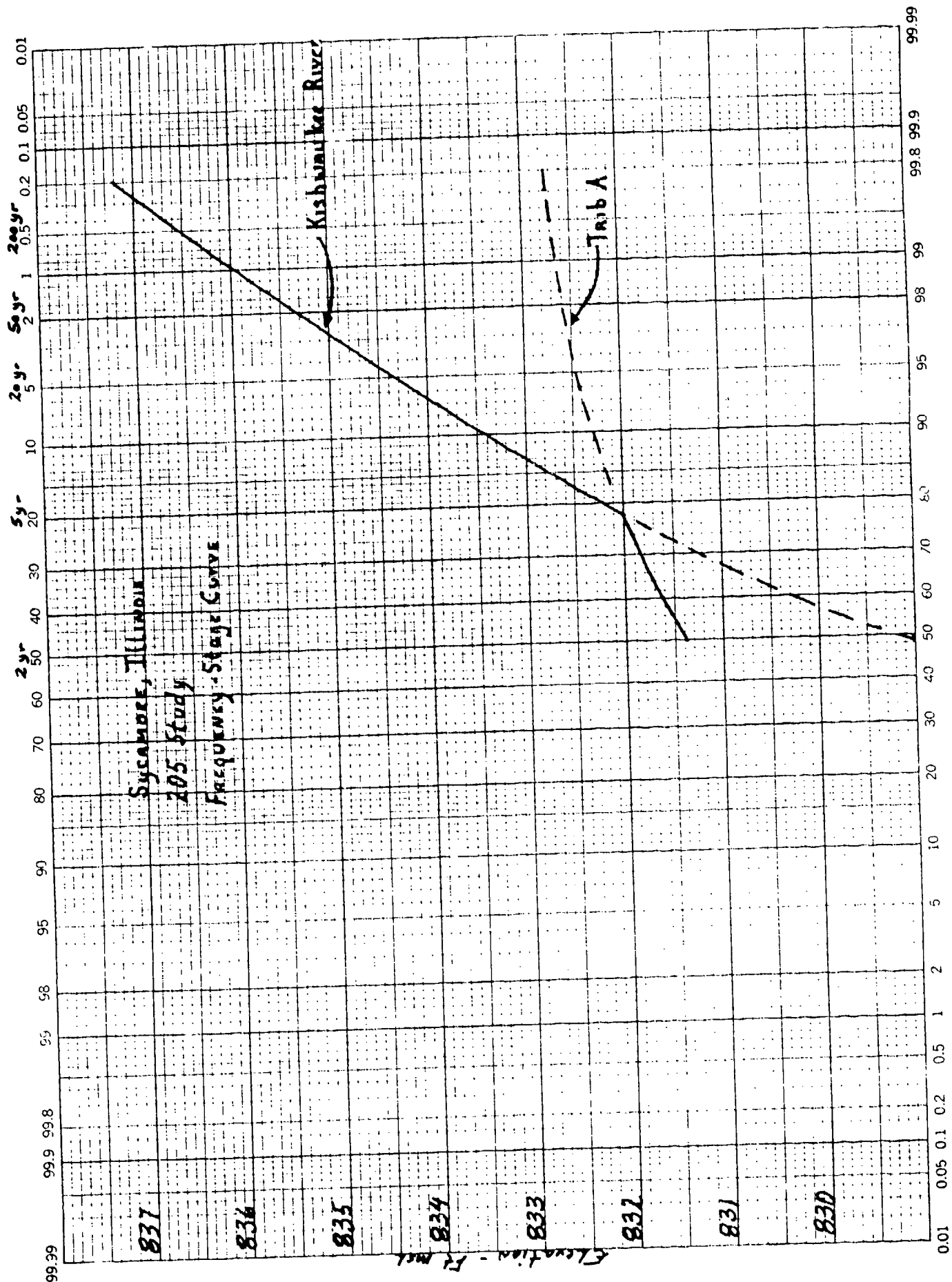
Miles Above Mouth of Rock River

Sycamore, Illinois  
205 Study  
Tributary A

100-Year Flood



Feet above Confluence with E.Br.-S.Br. Kishwaukee River



ECONOMIC AND SOCIAL  
ANALYSIS

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SOUTH BRANCH KISHWAUKEE RIVER NEAR SYCAMORE  
DEKALB COUNTY, ILLINOIS

RECONNAISSANCE REPORT FOR  
SECTION 205 FLOOD CONTROL PROJECT

APPENDIX B

ECONOMIC AND SOCIAL ANALYSIS

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SOUTH BRANCH KISHWAUKEE RIVER NEARY SYCAMORE  
DEKALB COUNTY, ILLINOIS

RECONNAISSANCE REPORT FOR  
SECTION 205 FLOOD CONTROL PROJECT

APPENDIX B

ECONOMIC AND SOCIAL ANALYSIS

SECTION 1 - ECONOMIC ANALYSIS

The following economic analysis examines the feasibility of providing protection from recurrent flooding at Sycamore, Illinois, under the authority of Section 205 of the 1948 Flood Control Act, as amended.

ESTIMATE OF BENEFITS

Benefits were based upon the reduction of flood damages. Data for the estimation of flood damages prevented was obtained from local officials and through field observation. Annual benefits are arrived at through the application of hydrologic frequencies to the possible damages at each half-foot increment in elevation. The alternative was analyzed using a 50-year project life and a 7-3/8 percent rate of interest.

The project area is primarily a mobile home park with over 120 trailers currently occupying the site. These trailers are permanently located and thus, not easily evacuated during flood conditions. The damage to mobile homes in a flood is fairly uniform. It is estimated that 100 percent damage will be sustained when the water is six feet above floor level.

Benefits derived from implementation of the flood control measures are explained below and summarized in Table B-1.

PLAN C: PERMANENT EVACUATION/RELOCATION

The benefit is determined by summing the reduction in externalized flood damage which includes emergency costs saved and insurance administration cost saved. Other benefits which occur because of relocation are the increase in property value because of the new location and the benefits from the flood plain's new use. The corresponding benefits are:  
 $(\$154,000 + \$2,400 + \$18,000) + \$264,300 + \$5,500 = \$445,000$ . The net benefit is \$241,420.

TABLE B-1

Benefits

<u>Alternative</u>	<u>Level of Protection</u>	<u>Average Annual Damage Avoided \$</u>	<u>Insurance Administration Costs Saved \$</u>	<u>Difference in Value \$</u>	<u>Emergency Costs Saved \$</u>	<u>New Use \$</u>	<u>Average Annual Benefit \$</u>
Permanent Evacuation/ Relocation	SPF	154,000	18,800	264,300	2,400	5,500	445,000

### ESTIMATE OF COSTS

The relocation alternative is a measure which would eliminate flood damages up to the standard project flood stage. The costs of the alternative are explained below and summarized in Table B-2.

TABLE B-2

#### Cost of Alternative C

<u>Alternative</u>	<u>First Cost \$</u>	<u>Interest During Construction \$</u>	<u>Total First Cost \$</u>	<u>Annual Cost \$</u>	<u>Annual Maintenance \$</u>	<u>Total Annual Charges \$</u>
Permanent Evacuation/ Relocation	2,540,000	93,663	2,633,663	199,895	0	199,895

#### Assumptions:

7-3/8% Annual Interest Rate

50-year Project Life

1-year Construction Time

1/2 Construction Cost Incurred by Mid Year

#### PLAN C: PERMANENT EVACUATION/RELOCATION

This flood control measure could be accomplished by moving all the mobile homes, streets, utilities, and related structures out of the flood plain. The cost would be \$2,540,000 plus interest charges of \$93,663. Total first costs of \$2,633,663 have an annual cost of \$199,895. No maintenance is required for this procedure.

### OPTIMIZATION

In order to choose the best solution to the flood control problem, an optimization procedure is used. Table B-3 illustrates the cost, benefit level, and benefit-cost ratio.

TABLE B-3

#### Optimization

<u>Alternative</u>	<u>Average Annual Cost \$</u>	<u>Average Annual Benefit \$</u>	<u>Net Benefit \$</u>	<u>B/C</u>
Permanent Evacuation/ Relocation	199,895	445,000	245,105	2.23

### SECTION 2 - SOCIAL IMPACT ANALYSIS

The East Branch of the South Branch of the Kishwaukee River near Sycamore, Illinois, is subject to recurrent flooding which causes considerable damage in DeKalb County, particularly to the residences of Evergreen Village Mobile Home Park. This analysis examines the impact of alternative flood damage reduction measures on the social well-being of the residents living in the affected area.

#### FLOODING CONDITIONS

##### WITHOUT PROJECT

Under current conditions, the East Branch of the South Branch of the Kishwaukee River at Sycamore overtops its bank frequently. When this flooding occurs, evacuation of the entire trailer park often becomes necessary. Electricity and natural gas lines have to be shut off. During some past flooding occurrences, the health department has determined that a health hazard existed due to flooding of a sewage plant in the area.

## WITH PROJECT

With the implementation of some type of flood control project, floods will be limited to no more frequently than the 20-year level in some cases and to the 100-year level in others, depending on the type of project and the level of protection built into the project design.

### SOCIAL IMPACT

The impact on social well-being which will occur from these projects is dependent upon the type of project. Channel improvement and the diversion channel have very little impact beyond the initial raised noise level due to construction. All projects have associated construction noise. The floodwall, levee, and fill may have negative impacts as far as decreasing the aesthetic value of the area and discouraging community growth and cohesion. Relocation may have a positive effect on social well-being because it alleviates the flood problems; however, no information is available on residents' feelings on relocation.

### ECONOMIC IMPACT

Because of the year-long construction period, business and the labor force will both be positively impacted by all the proposed alternatives. Regional growth will be affected minimally, if at all. There will be little impact on tax revenues and property values for the channel improvement and diversion channel; a positive impact comes from relocation or fill. Loss of trailers to make room for the floodwall or levee will have an adverse effect. Public facilities and services will be minimally affected except by relocation which will have a positive effect on facilities because of provision of new facilities.

### SUMMARY

In general, relocation would be the best method of flood control in this situation because of the positive effects it would produce on the social well-being of the community. Table B-4 presents a summary evaluation of the social and economic impacts including those required to be considered by Public Law 91-190, National Environmental Policy Act, 1 January 1970, and Public Law 91-611, River and Harbor and Flood Control Act of 1970, 13 December 1970.

TABLE B-4

Project Impacts

<u>Social Impact</u>	<u>PROJECTS</u>					
	<u>Relocation</u>	<u>Channel Improvement</u>	<u>Diversion Channel</u>	<u>Floodwall</u>	<u>Levee</u>	<u>Fill</u>
Noise	0	-	-	-	-	-
Displacement of People	-	0	0	-	-	-
Aesthetic Values	0	0	0	-	-	-
Community Cohesion	0	0	0	0	0	0
Community Growth	+	0	0	-	-	-
<u>Economic Impact</u>						
Tax Revenues	0	0	0	-	-	0
Property Values	+	0	0	+	+	+
Public Facilities	0	0	0	0	0	0
Public Services	0	0	0	0	0	0
Regional Growth	0	0	0	0	0	0
Employment/Labor Force	+	+	+	+	+	+
Business/Industrial Activity	+	+	+	+	+	+
Displacement of Farms	0	0	0	0	0	0

+ Positive Impact  
 - Negative Impact  
 0 Minimal or No Impact

Evaluations are based on changes from no project conditions.

#### SUMMARY

In general, relocation would be the best method of flood control in this situation because of the positive effects it would produce on the social well-being of the community. Table B-4 presents a summary evaluation of the social and economic impacts including those required to be considered by Public Law 91-190, National Environmental Policy Act, 1 January 1970, and Public Law 91-611, River and Harbor and Flood Control Act of 1970, 13 December 1970.

**PERTINENT CORRESPONDENCE**

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SOUTH BRANCH KISHWAUKEE RIVER NEAR SYCAMORE  
DEKALB COUNTY, ILLINOIS

RECONNAISSANCE REPORT FOR  
SECTION 205 FLOOD CONTROL PROJECT

APPENDIX C

PERTINENT CORRESPONDENCE

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Letter From DeKalb County Board, dated 29 July 1981	C-8



## DeKalb County

June 29, 1979

County Board

Colonel F. W. Mueller, Jr.  
District Engineer  
U. S. Army Engineer District  
Rock Island/Clock Tower Building  
Rock Island, Illinois 61201

Re: Proposed Local Flood Protection Project  
Evergreen Village Mobile Home Park

Dear Colonel Muller:

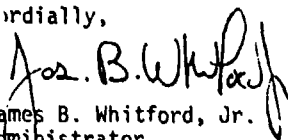
This letter is to request the assistance of the United States Army Corps of Engineers under Section 205 of the 1948 Flood Control Act in providing flood protection to the County of DeKalb.

A serious flood problem is present at the property commonly known as the Evergreen Village Mobile Home Park located on State Route #64 immediately east of the city limits of Sycamore, Illinois. For your further information I am enclosing herewith copies of a legal description, plat of survey and floodplain map pertinent to this property, as well as a copy of a letter from the DeKalb County Civil Defense Director summarizing recent flooding problems experienced thereat.

Members of your staff inspected the site on Tuesday, June 26th. Also on that date they reviewed the scope of the problem with the County Civil Defense Director, the County Planning Director and myself.

Appreciative of your consideration of this request, and hopeful that the Corps of Engineers will be able to work with the DeKalb County Government in alleviating this serious flooding problem, I am

Cordially,

  
James B. Whitford, Jr.  
Administrator

JBW:lk



## United States Department of the Interior

FISH AND WILDLIFE SERVICE

IN REPLY REFER TO:

ROCK ISLAND FIELD OFFICE (ES)

1830 SECOND AVENUE

Com: 309-793-5800

ROCK ISLAND, ILLINOIS 61201

FTS: 386-5800

January 2, 1981

Colonel Frederick W. Mueller  
District Engineer  
U.S. Army Engineer District  
Rock Island  
Clock Tower Building  
Rock Island, Illinois 61201

Dear Colonel Mueller:

On October 14, 1980, we met with members of your staff at the project site of the Section 205 Flood Control Reconnaissance Study for the South Branch Kishwaukee River near Sycamore, Illinois, in DeKalb County. This letter provides our planning aid comments on the relocation alternatives proposed at the site inspection and other proposed flood control measures.

Twelve alternatives for flood control are being studied. Of these, flood insurance, floodproofing and no action require no additional land use and would not impact on fish and wildlife resources. The earth levee, floodwall, filling the trailer park, tributary channel improvements and widening the Kishwaukee River may all adversely affect fish and wildlife resources.

Tributary channel improvements and widening the Kishwaukee River are the least desirable alternatives. These involve the removal and degradation of aquatic habitat and biota. Studies have shown channelized sections of streams to be less productive than non-channelized sections. The U.S. Fish and Wildlife Service generally opposes stream channelization.

Two areas of impact may result from construction of the earth levee, floodwall and filling the trailer park. First, the flood waters would be confined to a smaller area and may increase in velocity and scour the stream. Downstream flooding may also increase, thus transferring the problem elsewhere. Secondly, in protecting the trailer park from the stream overtopping its banks, valuable streamside vegetation may be lost. Streamside vegetation is a vital link in the aquatic food web. It provides a major source of organic material and cools the stream through shading.

The remaining alternatives of zoning, relocation, non-structural combination and dam and reservoir may be beneficial or detrimental to the natural resources of the project area. In relocating the trailer park, if the old site is enhanced to a habitat value greater than that of the new site, a net gain in habitat value would occur. Conversely, if the trailer park was relocated and the old site was used for parking or some other type of development, a net habitat loss would result, valued at the loss of the new site plus any further degradation to the existing habitat near the old trailer park.

During the October 14, 1980 site inspection with members of your staff, seven possible areas for relocation of the trailer park were viewed (see attached photos). All the proposed sites are agricultural or old field lands. Relocating the trailer park to one of the seven sites would reduce any food and shelter benefits the field might offer birds and small furbearers. However, impacts resulting from relocation of the trailer park to one of these seven areas are not expected to be significant.

The dam and reservoir alternative may provide an excellent opportunity to enhance fish and wildlife resources and recreation. For a seasonal reservoir, the area could be managed for park, recreation and wildlife feeding habitat. Ground-nesting habitat should be discouraged. A year-round reservoir would provide fisheries benefits as well as an increase in the recreational value of the area. However, fish and wildlife resources could realize a net loss if the dam and reservoir alternative significantly affected valuable wetland, riparian or stream habitat.

In summary, we favor 1) the dam and reservoir alternative if wetland, riparian or stream habitat is not significantly affected, 2) the no impact alternatives (flood insurance, floodproofing and no action) or 3) relocation (zoning, relocation, nonstructural combination) if it does not result in further degradation of fish and wildlife habitat at the present trailer park site.

We do not encourage the earth levee, floodwall, filling the trailer park or tributary channel improvements. The U.S. Fish and Wildlife Service would oppose widening the Kishwaukee River.

These comments provide technical assistance only and do not constitute the report of the Secretary of Interior on the project within the meaning of Section 2(b) of the Fish and Wildlife Coordination Act, do not fulfill the requirements under Section 7 of the Endangered Species Act, nor do they represent the review comments of the U.S. Department of the Interior on any forthcoming environmental statement.

Sincerely yours,



Thomas M. Groutage  
Field Supervisor

**Attachments**

cc: Illinois Department of Conservation (Bertrand & Schanzle)  
Illinois Environmental Protection Agency  
U.S. Environmental Protection Agency (Beno)  
Ms. Sue Pfluger  
DeKalb County Planning Department, Courthouse annex,  
Sycamore, Illinois  
U.S. Fish and Wildlife Service, North Kansas City, MO  
U.S. Fish and Wildlife Service, St. Paul, MN (RA)

WCRD-PR

1 JUN 1961

SUBJECT: Flood Control in DeKalb County on the Kishwaukee River near Sycamore, Illinois

Mr. James B. Whitford, Jr.  
County Administrator  
DeKalb County Board  
104 North Main Street  
Sycamore, Illinois 60178

Dear Mr. Whitford:

The Rock Island District has been investigating possible solutions to flooding at the Evergreen Village Mobile Home Park. We have formulated several plans. Due to the nature of our findings, we believe that written correspondence can express the desires of the county in this study.

Several plans were formulated to provide flood protection. The plan which would be recommended for detailed study is permanent evacuation/relocation of the mobile home park and floodproofing of the businesses located to the east of the Kishwaukee River. Preliminary costs were developed for the permanent evacuation/relocation portion of the plan but not for the floodproofing portion. The preliminary cost estimate for the permanent evacuation is \$2.7 million. Under present Federal guidelines, 20 percent of this cost would be borne locally and 80 percent would be borne by the Federal Government. However, the continuing project authority used to begin this study has a Federal cost limit of \$2 million. Therefore, the local share would be \$700,000 and any increases in project costs above the \$2.7 million would need to be borne 100 percent locally. If congressional support is available to the county, it would be possible to change the study authority to a General Investigation study initiated by a congressional resolution. This would remove the \$2 million limit; however, the 20-80 percent split would still remain in effect.

We would appreciate a letter expressing the views of the county on your ability to participate in a project of the scope indicated by the preliminary study. The normal requirements of local interests in these types of projects are shown on Inclosure 1. Whether or not the funds will be committed to start a detailed study will be determined by the views of the county. The Reconnaissance Report will be completed regardless of the financial or economic feasibility of the project.

WCRFD-PR

Mr. James B. Whitford, Jr.

1 JUN 1961

In our plan formulation studies, we also considered constructing a levee or floodwall around the mobile home park. Although this plan appears to be economically feasible and less costly than evacuation/relocation, the construction in the floodway of a ring dike protection system creates other problems. Access during flooding would be a problem as well as possible induced damages by increased flood heights upstream or near the ring dike. This system would also induce continued development in the flood plain. These reasons lead us to recommend against further study of these protection systems.

If you need any other assistance or clarification of these plans, please do not hesitate to call the study manager, Mr. Peter Raven, at 309/788-6361, Ext. 6342.

Sincerely,

DOYLE W. McCULLY, P.E.  
Chief, Engineering Division

GENERAL POLICY ON LOCAL COOPERATION FOR NONSTRUCTURAL PROJECT

Local interests (hereinafter called Sponsor) shall comply with the local cooperation requirements set forth for all projects constructed under the special continuing authorities. In general, the following provisions of local cooperation shall be required:

a. Provide contributions for nonstructural measures equal to 20 percent of the total first cost allocated to these measures;

b. Hold and save the United States free from damages due to the construction works, not including damages due to the fault or negligence of the United States or its contractors;

c. Operate and maintain all the works after completion of the project in accordance with regulations prescribed by the Secretary of the Army;

d. Comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, approved 2 January 1971, in acquiring lands, easements, and rights-of-way for construction of the project;

e. Contribute any funds required in excess of \$2,000,000 in the event the Federal cost for the aforesaid project should exceed said amount; and

f. Grant the Government a right to enter upon, at reasonable times and in a reasonable manner, lands which the Sponsor owns or controls, for access to the project for the purpose of inspection, and for the purpose of completing, operating, repairing, and maintaining the project, if such inspection shows that the Sponsor, for any reason, is failing to complete, operate, repair, or maintain the project in accordance with the assurances hereunder and has persisted in such failure after a reasonable notice in writing by the Government, delivered to the appropriate official. No completion, operation, repair, or maintenance by the Government in such event shall operate to relieve the Sponsor of responsibility to meet its obligations as set forth in the assurances or to preclude the Government from pursuing any other remedy at law or equity.

*Encl 1*





**DeKalb County**

July 29, 1981

**County Board**

Mr. Doyle W. McCully, P.E.  
Chief, Engineering Division  
Corps of Engineers  
Rock Island District  
Clock Tower Building  
Rock Island, Illinois 61201

Re: Flood Control in DeKalb County on the Kishwaukee River  
near Sycamore, Illinois

Dear Mr. McCully:

Reference is made to your correspondence of June 1, and my response thereto of June 6, pertinent to the captioned matter.

Please be advised that the DeKalb County Board has determined that the problem posed by flooding at the Evergreen Village Mobile Home Park is not of sufficient priority to warrant the expenditure of one-half million dollars or more of County monies, as required to effectuate the remedy recommended by your reconnaissance study. Such determination is in no way intended as an adverse reflection upon the adequacy of your study, or the viability of the solution proposed. Simply put, the service demands made on the County are many, and its financial resources are meager; and the danger presented by this flooding problem does not warrant so depleting those meager resources, considering other problems now confronting the County.

The DeKalb County Board is very appreciative of the efforts of your staff in conducting the reconnaissance study, and of your patience in awaiting this advice.

Cordially,

James B. Whitford, Jr.

JBW/nw

County House      Sycamore, Illinois 60178

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FOR SECTION 205  
FLOOD CONTROL PROJECT

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2200 CHURCHILL ROAD, SPRINGFIELD, IL 62706

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62706

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